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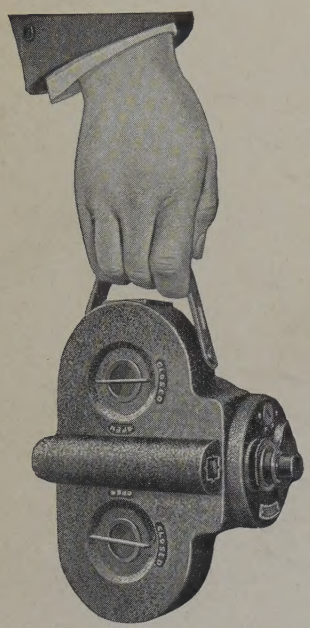

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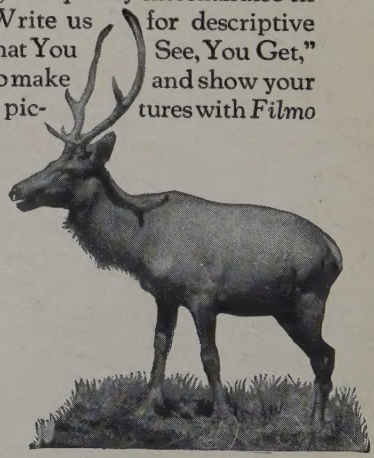

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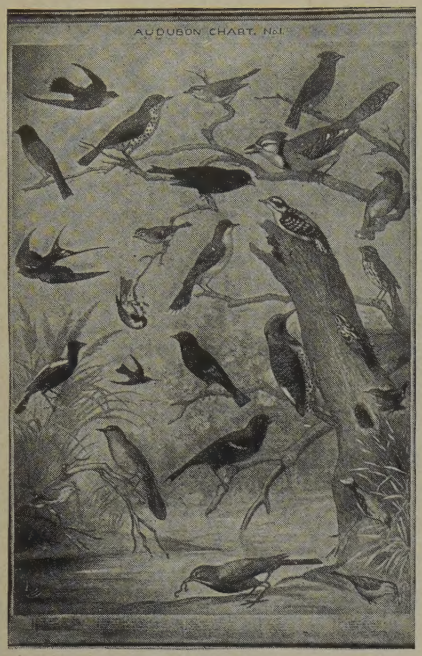

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A Helpful Letter

We were delighted the other day to receive a long letter from Mr. Arthur R. Harper of Columbus, Ohio, and so valuable were the thoughts expressed in it, we are reprinting the bulk of it. Mr. Harper is by vocation an auditor but by avocation a practical and happy naturalist with the all too infrequent faculty of passing it along to others. He has been active in furthering public knowledge of Nature to a notable degree.

"A great deal of my work," Mr. Harper writes, "has been done in camps of boys or girls, in many of which I found a leader in charge of the Nature study work, but seldom have I found a good leader. Sometimes it will be a biologist from a university. He seldom creates interest because he cannot get away from the academic view. Particularly if he has been engaged in research work, he has lost the thing he most needs and he is as dull as the proverbial dishwater. To him, an evening primrose is *Oenothera biennis* instead of a golden, smiling blossom with an odor as delicately beautiful as anything a Parisian perfumer has concocted. Or, for a leader, we may find a student from the university who has done much laboratory work and little field work, one with a B.A. degree that needs careful protection when it is taken into the field. These fail to create interest in the camp because they are afraid to. If they should accidentally get folks interested, it would be disaster. I had a sample of that in a camp last summer. There was a student in charge and a fine group of girls, just bubbling with enthusiasm but they did not know even the Queen Anne's lace that grew profusely about the tents and did not care. Hadn't really noticed the stuff, to be exact. The Nature study leader had been very careful not to start anything that she could not stop.

"I was a bit puzzled how to get them interested and concluded to use a game I have often tried with success. I gathered them about me in a circle and disabused their minds of the idea that I was going to make a speech about Nature, as the leader had said I would. I asked them if they would like to know something about the flowers growing around camp and got a very polite and perfunctory yes from several. 'All right,' said I, 'when I whistle, you scatter in all directions. Find a plant with a flower on it. Bring it in and I'll tell you what it is. I *dare* you to find something I don't know.' I felt quite safe about that, for I was in just ordinary mid-Ohio country along a stream with some low shale bluffs and I was not afraid of what they would bring. But that dare

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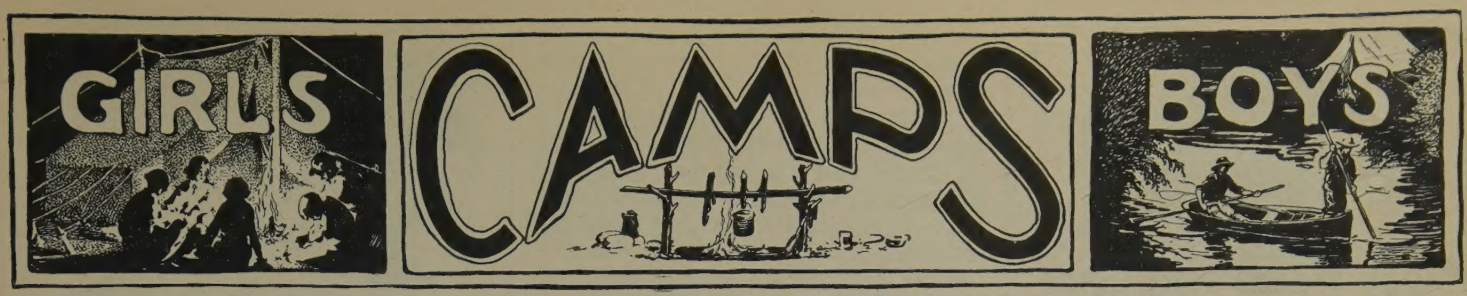

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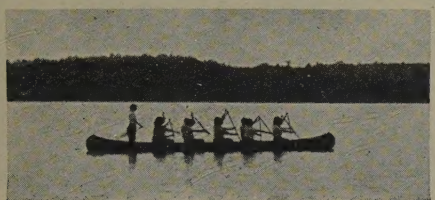

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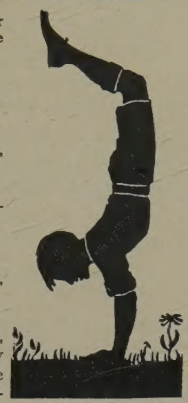

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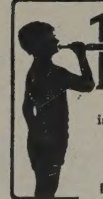

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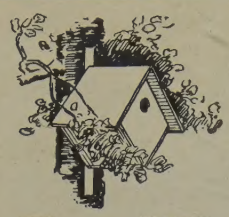

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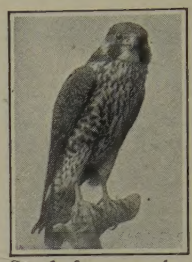

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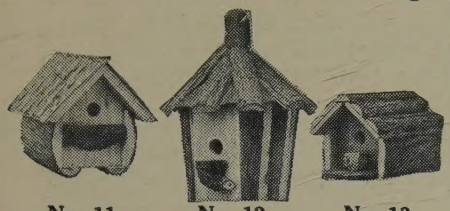

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to say 'I don't know' when they don't. I sometimes say, 'There's one I don't know—praise the Lord.' I'd regret the day I knew them all, if such a day were possible. But I do insist on knowing enough to keep up a respectable batting average, whether it is flowers, butterflies, stars or mosses we are looking at.

Inquisitive Sparrows

By Ernst Keil

One summer day we discovered an enormous flock of English sparrows assembled on our lawn almost directly under the kitchen window. The whole bunch seemed to be immensely interested in something that we could not see at first. All were gathered around an open space of less than a square yard and were gazing so eagerly that they paid no attention whatsoever to us watching them from the open window; they seemed to be stricken with uncontrollable curiosity. With plumage flattened against their bodies and their necks stretched to ridiculous lengths, they appeared to be standing on tiptoe.

In scanning the unusual scene a little closer we finally found the object of so much sparrow curiosity: A snake about two feet in length was literally hemmed in by that mob of birds, and they were so close to the reptile that he could barely move; in fact he had to push his way forward inch by inch. Whenever his head came too close for comfort to the birds nearest him, they would back up a little and the snake would crawl ahead that amount. The sparrows showed not the least fear or even alarm, neither did they exhibit hostility, but all seemed to be controlled by irrepressible curiosity. They all joined in what is perhaps best described as a very low but distinctly audible whispering, and even their voices expressed surprise and astonishment; they seemed to ask each other: "Well, what do you suppose this is?" I do not know the name of the snake. It was of a beautiful shade of brown with a yellow-golden stripe running along on each side. The reptile on his part showed a great deal of patience with this bunch of sparrows.

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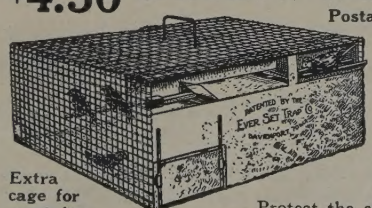

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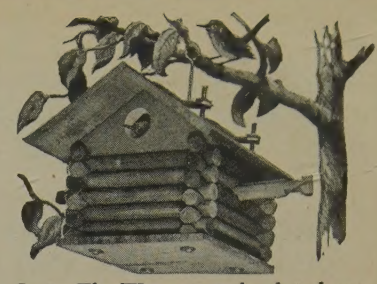

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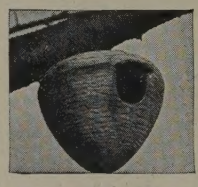

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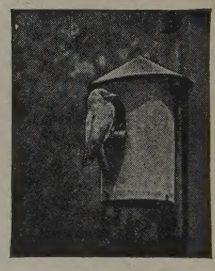

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TABLE OF CONTENTS

April, 1926

Robin Redbreast	R. Bruce Horsfall	Cover
Nature Calendar		201
First Animals of the Land	John T. Lambert	203
When It Rained Lemmings	Edward A. Preble	206
Roses for All and All for Roses	Alvin C. Beal	207
Tent Caterpillars and Their Control	A. B. Champlain	211
Pearls—Jewels of Antiquity	Paul Bartsch	213
Some Giants of Mothdom		218
Tree Buds—Their Story	Mary F. Robinson	219
Spirit Voices of the Early Dawn	R. Bruce Horsfall	223
The Life of the Varying Hare	A. Brooker Klugh	228
Marco Polos of the Wind	Ben Hur Lampman	230
Ken Goes to Camp	John B. Cuno	231
Ten Interesting Things to See in April	E. Laurence Palmer	235
Leo, the Lion, and the April Skies	Isabel M. Lewis	237
Nature Education		239
Notes on Some Woody Plants	E. Laurence Palmer	240
Nature Photographers Page		241
Our Program		242

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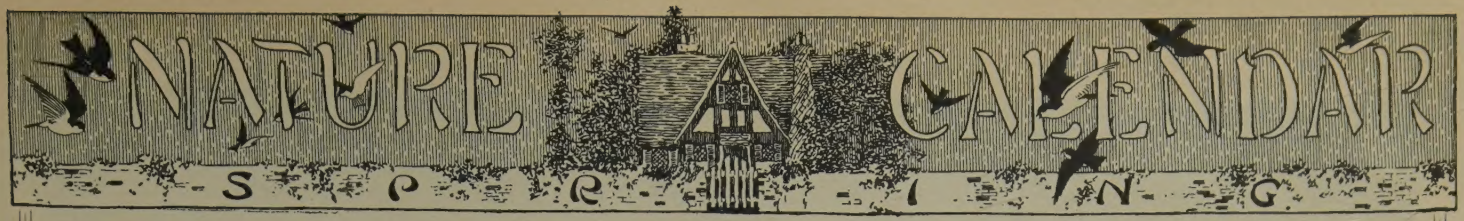


APRIL

"Oh, hush, my heart, and take thine ease,
For here is April weather!
The daffodils beneath the trees
Are all a-row together.

The thrush is back with his old note;
The scarlet tulip blowing;
And white—ay, white as my love's throat—
The dogwood boughs are glowing.

The lilac bush is sweet again;
Down every wind that passes,
Fly flakes from hedgerow and from lane;
The bees are in the grasses."

—Lizette Woodworth Reese.

The semicolon, comma, and red admiral, bright-colored butterflies, are now flying about.

Among matted leaves on the woodland floor, acorns and other seeds are putting forth roots and taking firm hold on the soil.

In walking through the woods, what appears to be a bit of brown stick may take flight in a rosy streak. This is the coral-wing locust, one of the earliest to appear in the spring.

April is the time for fairies. Search carefully the bottom of a pool and you will find some. They are tiny, almost transparent creatures with plumy fins of scarlet along their sides, forked tails, and large black eyes. Fairy shrimp (*Branchippus vernalis*) they are called.

Spring flowers are in abundance in the woodlands. Familiar ones are squirrel corn, spring beauties, bluets, anemones, trillium, bloodroot, yellow violets, yellow adder's tongue, hepatica and many others.

The brownish-purple blossoms of the wild ginger seem to echo in color the woodland mould beneath them.

Fronds of the cinnamon fern are unrolling.

Maple leaves are beginning to unfold and the sugar season is passed.

April showers draw out the rich odors of decaying leaves and freshly turned loam.

Tree swallows are returning north. Their white breasts flash as they skim over the fields catching insects on the wing as they go.

Mr. Goldfinch, in bright yellow spring feathers, is all ready for the Easter dress parade.

Bluebirds are inspecting home-sites in the orchard with a view to locating where they best can raise their families.

Unlike his woodpecker kin, the flicker is a noisy bold fellow. His spring song of "Quick, quick, quick, quick" resounds through the woodlands.

Draco, the great dragon which winds between the Bears, is now conspicuous in the heavens.

Along woodland borders the delicate white or magenta-tinted flowers of the wood anemone or wind flower are in bloom.

Standing out boldly on the tip-top branch of the tree in the clearing, the brown thrasher is advising the farmer that it is time to "Plough it, plough it; hoe it, hoe it."

Fortunate and few are the tadpoles of the leopard frog which grow up to hop, for all about them in the ponds are hundreds of water enemies such as water-tigers, back-swimmers, diving beetles, leeches, fish, turtles, and water birds, all relishers of tadpoles. Even their own kin are not to be trusted.

Flocks of poisy grackles gather in the pines.
"First come the blackbirds, clatt'rin' in tall trees,
An' settlin' things in windy congresses."

Many tree-homes are full of babies. Both squirrels and raccoons are busy raising families in them.

Muskrat homes, too, are filled with many tiny young.

Turn over a stone and see what you can find. Maybe there will be black beetles or a salamander which glides away to some other shelter.

Full-voiced now is the chorus of the spring peepers. Their music predominates in the marshes and ponds.

Eumenes fraterna, the jug-maker wasp, will soon make a little brown jug-like home securely fastened to a twig. Within an egg is laid and with it is put a supply of green caterpillars which have been paralyzed by a sting, and which are to serve as food when the young hatches. The opening is then plugged with mud.

Shad will leave the ocean and swim up the rivers to their spawning grounds. Schools of males precede the females.

Prepared for Nature Magazine by the Cleveland Museum of Natural History

THE FIRST LADY OF THE LAND, ROB ROY AND PAUL PRY

PHOTOGRAPH NATIONAL PHOTO

Mrs. Coolidge finds particular joy in the White House pets, and these first animals of the land are equally happy in her friendship.

PROVISO TOWNSHIP HIGH SCHOOL
WOOD, IL

NATURE MAGAZINE

Vol. VII APRIL, 1926 No. 4

Our country . . . is a land of varied climes and scenery, of mountain and plain, of lake and river. It is the American heritage. We must make it a land of vision, a land of work, of sincere striving for the good, but we must add to all these, in order to round out the full stature of the people, an ample effort to make it a land of wholesome enjoyment and perennial gladness.—CALVIN COOLIDGE.

FIRST ANIMALS OF THE LAND

By John T. Lambert

Here is a refreshing pet story, one, in fact about what we may call the "first pets of the land." They live, most of them, in the big white house in our capital, where dwell Mr. and Mrs. Calvin Coolidge. The article is written by a well-known Washington correspondent, and a friend of the Coolidges for many years. The President calls him John.

IF YOU had the ears of a certain dog in the United States, you would know more important, inside secrets of state than any other person in the world, except one.

You would know why, when and how the United States proposes to conduct a war of retaliation upon foreign-government monopolies, like rubber and potash. You would know how much the Government proposes to collect from France in settlement of the $4,000,000,000 war debt. You would know to what extent the United States intends to demand disarmament of the world governments at the coming Geneva conference. You would know what chance there is of taking Russia into the family of nations.

In short, you would be able to forecast the future relationship of the United States to the world, and, since we hold the world's purse and, therefore, its destiny, largely in our hands, you would be in a magnificent position to write in advance a current history of the peace and war, the penury and plenty, the weal and the woe that will be visited upon man in the next few years to come.

What would the statesmen and diplomats of the world give to know all this? What would empires, monarchies and republics yield for these vast secrets of state?

I will tell you who knows many of these secrets. Rob Roy knows them. Yes, Rob Roy, the long-nosed, sad-eyed, white collie of the White House. When you see him on the street with Mrs. Coolidge, galloping, rollicking, fun-making, alive with vigor and joy, you say to yourself, "There's the happiest dog in the world. Isn't he beautiful, and, oh, so full of fun!"

But you didn't know that for several hours on that very day, Rob Roy, in the White House executive offices, lay at the feet of his master, President Coolidge, his long nose between his paws, his eyes wide open, his ears cocked, tense and alert, while the innermost secrets of state, affecting the destiny of the world, were fully, frankly and freely discussed! Do you wonder he is sad-eyed at times? Do you wonder that a mere animal, carrying in his breast such valuable secrets of vast import, longs for the open spaces of the White House grounds, there to gallop with reckless abandon; to gather in fun and play a respite from the heavy cares of statesmanship; to clear his mind, as it were, from the heavy burdens of the day that he may be in shape, with uncluttered brain, to take up the tasks of the morrow?

All work and no play makes Jack a dull boy. Well, if that applies to Jack, how

PHOTOGRAPH HENRY MILLER

BLACKIE AND TIGER, WHITE HOUSE KITTENS

The President was much upset when the latter got himself lost, but now both have gone, it is believed, as tourist souvenirs.

much more to Rob, whose curriculum is not confined to the fourth grade of a little red schoolhouse, but is measured by the four quarters of the globe?

And one more thing I will tell you, that history may give him the reputation which he deserves. Rob Roy has never revealed a secret of state.

I assume he has had serious temptations. I have seen diplomats stroking his head. I have seen society matrons, whom I roundly suspect of trafficking in international diplomacy, tug his white coat and vamp him with eyes to which mere man would easily succumb. But Rob's record is as spotless as his white mane. The character displayed by this reserve can well be appreciated in official Washington, which realizes that man can scarcely be entrusted with any secret, great or small.

President and Mrs. Coolidge have had a houseful of pets since this republic vested in him its leadership. There is Rob, of whom I will tell more. There is Prudence Prim, the five-month-old white collie, which the President and Mrs. Coolidge decided must be brought to keep Rob company after they had at times detected a spirit of lonesomeness in him. Rob came, by the way, from the Island White Kennels in Oshkosh, Wisconsin. Isn't it interesting that the only Republican state which the President failed to carry in the last election has supplied him with two of his best-loved companions and pets?

There is Paul Pry, the red Airedale, thus named by Mrs. Coolidge because he had his nose into everybody's business, and who was relinquished to the Marines at Swampscott last summer because he developed an overfondness for the trousers' legs of distinguished visitors. A friend of mine, who knows him well, declares that Paul is a much-maligned and unjustly abused dog; that, in fact, he was a loyal and true friend.

This is to be a true record. A dog is a dog and a cat is a cat, with all their virtues, idiosyncrasies and demerits. But once they reach the White House they take on a prestige, which the fulfillment of, or failure to comply with, reflects credit or discredit down through all the less conspicuous members of their tribe. It is an axiom that public servants must not only be right, but must appear to be right. That carries also to animals who achieve distinction by their occupancy of the First House of the Land and their fraternizing with the great and the near-great.

PHOTOGRAPH HENRY MILLER

PAUL PRY, NOW A "DEVIL DOG"

So great was his devotion to Mrs. Coolidge he guarded her at the expense of several shins and ankles and was finally banished to the Marine Corps.

There are, or were, the two cats, Tiger and Blackie. They were sent to Mrs. Coolidge by a little schoolgirl in Massachusetts. Tiger was gray, and marked with the perpendicular lines of the cat of the forest from which he attained his name. He got himself lost.

Now, in affairs of state, in meeting the world's leaders eye-to-eye, the President is cool, taciturn and unruffled. But when it comes to family pets, that's a different matter.

The President walked nervously around the spacious White House grounds, looking up into trees and down into rose bushes. "Have you seen it?" he demanded of every White House workman he met. A flash of alarm crossed their faces. Here, this quiet man was visibly alarmed and affected. Certainly he must have lost the invitation to the Geneva arms conference or some equally important document of state.

"Seen what, Mr. President?" they asked in excitement.

"Why," he exclaimed, "the cat! It's lost!"

This cat didn't come back. The President was so insistent upon finding Tiger that the radio stations of Washington broadcast his absence and description to their thousands of radio patrons. All Washington was agog. Finally Tiger was discovered by a watchman in the Navy Building, two blocks away.

Gaudy little collars, with the words "White House" plainly inscribed upon them, were fashioned to the necks of Tiger and Blackie, and the President heaved a sigh of relief upon the return of the absent pet. But they are gone again. Not of their own accord, perhaps. Greatness has to run the risk of greatness. It is suspected that heartless

tourists, who would take the top off the Washington Monument for a souvenir, if possible, ran away with the two little pets which a charming Bay State schoolgirl thought would help President and Mrs. Coolidge to pass many a playful hour at night in the great White Building when the cares of the day demanded a change to recreation.

The veteran pets of the White House are a pair of canaries, German warblers, sent shortly after Mr. Coolidge became President by Edward Whiting of Holyoke, an old and dear friend. "In a beautiful gilded cage," they sing from the Blue Room, their peals rivalled but never exceeded in high pitch when the great United States Marine Band comes to play for the state receptions. A white canary, first of its type possibly, is now en route to the White House from California and may be there ere this article is published.

There was the big, white goose, sent to the President and Mrs. Coolidge at Swampscott by Marie Dressler when she was playing the Broadway show, "The Goose Woman." It was named "Enoch." Someone, probably the show's press agent, said it was worth $100,000. If so, Enoch is a $100,000 loss to the Coolidges. A door was opened at White Court early one morning, and out he went. The last seen of Enoch, he was beating it over the broad Atlantic as fast as his wings could carry him.

Enoch, foolish bird, couldn't rise to unaccustomed greatness. He probably has met up with friends of his own choosing by this time and has confided to them that he couldn't stand confinement. Possibly the stately courtliness of White Court was too much a contrast to the tinsel of the Great White Way.

There was the pet wallaby. A telegram to Secretary Everett Sanders said it was en route on a naval destroyer from Australia. "A wallaby," said Mr. Sanders to himself; "what in the heck is a WALLABY?" The President receives many cigars from admiring contributors. Possibly it was a new brand. Then, of course, new breakfast foods come upon the market daily with strange and hifalutin cognomens. Or, again, it might be the new and official emblem of the League of Nations.

But the keeper of the zoo at Rock Creek Park assured the White House that a wallaby was a marsupial animal, which pouches its young, fights with its tail and, as the old Irishman described, "runs when it jumps."

Mr. Wallaby came in state, aboard an United States ship of war. But the President decided that any animal, which

ROB ROY, CUSTODIAN OF MANY STATE SECRETS

Seated beside his master, the Chief Executive of the United States, he is the silent listener to the discussion of questions of world importance. He never reveals a secret.

could hurdle without trouble the enclosing iron fence of the White House, might possibly impede traffic on Pennsylvania Avenue some busy morning in the rush hours, not to speak of creating the impression upon visiting tourists from Skowhegan that the White House was a menagerie rather than a palace of government. So Mr. Wallaby was sent to the zoo.

There he shares the spotlight with the big brown bear, which rolled up to the front door in a van one bright morning to be left as a playmate for the President.

Now, about Paul Pry. My friend took him out of his traveling kennel the day he was delivered at the White House and saw more of him than any other person, except Mrs. Coolidge. He asserts and affirms that Paul was a devoted friend, with 2-o'clock-in-the-morning courage which Napoleon said was so lacking among his generals, and of the kind that would be at your side when all the world had turned against you.

It probably is true that intense affection for Mrs. Coolidge earned for Paul the reputation of being a snarly, snapping fellow. When any visitor was received at the White House, whether great or humble, Paul at once took his place between that visitor and Mrs. Coolidge. He was the twenty-four-hour-a-day protector, constant and ubiquitous. Paul came from Texas, under escort of an army officer, but one would have thought he was from Missouri and had "to be shown." Until Mrs. Coolidge, by her manner, denoted that the visitor was welcome and safe, Paul invariably kept that visitor in a state of suspense.

Little cause for marvel, therefore, that even after Paul was banished from White Court because of the embarrassment he caused, President and Mrs. Coolidge frequently walked over to the Marine camp a mile away to show him some return for the affection he had bestowed upon them.

Rob Roy just will chase autos. He was a sheep-dog on a big Wisconsin farm before he was sent to the White House. He has the collie instinct. It never will be broken, despite the advice of Vice-President Dawes.

When Mr. Dawes was at White Court, it was neither cloture, Senate rules nor the reparations plan that he and President Coolidge considered. They stood upon the lawn overlooking the sea, and Rob gave chase to an auto that appeared in the driveway.

"I'll tell you how to stop that," said the Vice-President to the President. "Drive an iron stake into the ground and give the dog about thirty feet of rope. When he chases an auto and comes to the end of the rope, he will bring up with such a jerk that he will be careful before chasing in the future."

Rob, as yet, has not been subjected to that treatment.

The dogs live in a specially constructed kennel under the south portico of the White House. Rob and Prudence Prim have the run of the White House, just as did Laddie Boy, who was the best-known pet of the late President and Mrs. Harding.

It has been said that one unfailing test of the true inwardness of man is the manner in which he treats dumb animals. Apply that test to President and Mrs. Coolidge and you will get the happiest and most satisfactory of reactions. They are sincerely fond of their White House pets.

When It Rained Lemmings

By Edward A. Preble

IN THE ancient lore of the Scandinavians may be found tales of a little creature which periodically appeared in numbers so vast as to defy computation, evidently falling from the clouds. These hordes traveled across the country, heedless of obstacles, even swimming large rivers and lakes, and never stopped until they reached the sea, into which they plunged and perished. This account, leaving out their supposed celestial origin, is today known to be true. A study skin of the animal (*Lemmus lemmus*) taken in Lapland, about one-half natural size, is here shown.

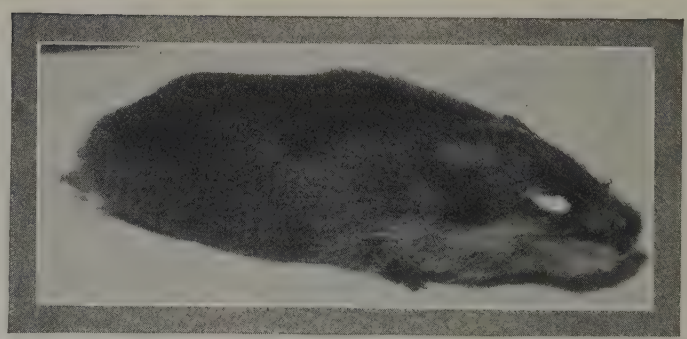


PHOTO BY INTERNATIONAL

THE ARCTIC LEMMING

Scandinavian lore says that this animal fell as rain in great numbers. The quantity is true but hardly the source.

When these little creatures, owing to a succession of favorable seasons and abundant food in their elevated habitat, have so increased as to overstock the country, they are led by some instinct to migrate. Their constantly augmented numbers are preyed on by various predatory birds and animals, and thousands perish. The same instinct that has induced them to cross successfully the rivers on their route, leads the survivors to enter the sea when they finally reach it, and thus their wanderings are ended.

Strange to say the same phenomenon takes place in this country. Related species which inhabit the Arctic and Alpine regions of northern Canada also periodically overstock their chosen habitats and start on migrations which assume creditable proportions. Owing, however, to the vastness of the country involved and its scattered population, they are dispersed and destroyed by their natural enemies or by disease without attracting the notice given them in their more restricted European haunts.

Besides being notable from this wandering habit, the Lemming is a blameless little animal, brave to the death.

What luck do you have with your rose garden? Many seem to have abominable luck, and in response to many requests we asked Professor Beal, of the Department of Floriculture at Cornell University, to prepare this helpful article.

A PORCH THAT WELCOMES THE VISITOR

The charm of the Dorothy Perkins rose vine is like a hand extended in greeting.

ROSES FOR ALL AND ALL FOR ROSES

By Alvin C. Beal

EVERY one loves roses, but many persons who would like to grow them are dismayed by the hard and fast rules laid down in books, The rose is neither the most difficult nor the easiest garden plant for the amateur to grow. Rose is a plant with a kind disposition, and its successful culture can be realized by the application of plain intelligence. One of the first things to understand in rose growing is that, while certain soils may make a great difference to the expert who is intent upon perfection of bloom, it does not follow that roses—yea, even good roses—may not be grown in soils quite different. First of all, therefore, let us understand that any soil that will grow good farm, fruit or vegetable crops will grow fine garden roses.

A very important consideration is where shall we grow roses? Not on the front lawn, certainly, for that is not the place for them or for anything else except green grass. With the exception of the *Rosa rugosa* and some of its varieties, most roses do not make, even under the best treatment, sufficient foliage mass to warrant their use as shrubs in the production of the landscape picture. If roses must be grown in the front yard, the proper place for them is near the boundaries, with a background of the above-mentioned species or other shrubs.

A VASEFUL OF ROSA RUGOSA

The flowers, fruit and foliage of a rose that makes a beautiful and strong hedge to enclose the garden.

Always choose a sunny position which is removed from the vicinity of large shade trees. Some of the foregoing statements will indicate why we prefer the rear of the place. Here the necessary treatment may be given the plants, winter or summer, without disturbing the neatness of the front yard or lawn which has been called the outdoor parlor.

The dwarf bush garden roses should be grown in beds or, if the purpose is solely for the production of buds or blooms for use in the home, the plants may be grown in rows in the vegetable garden. Most persons prefer to have both a floral display with some cutting of the blooms, and, of course, the culture in beds is best.

Beds five feet wide hold two rows of hybrid perpetuals or three rows of hybrid

teas and are made of sufficient length to accommodate all the plants grown. Round beds five feet in diameter would take eight plants of the hybrid perpetuals or twelve or thirteen hybrid teas. Narrower beds are sometimes made, but grass roots soon run through from either side, thus robbing the roses of food and moisture. Moreover, such beds are not suitable for any class except the "Baby ramblers," that is, the dwarf polyantha roses.

Having decided to grow roses in beds, the preparation of the soil should be our next thought. It is at this point that most of the disappointments in rose growing occur. Few persons, except experienced growers, realize the heavy feeding necessary to grow the fine roses seen in the flower stores, and notwithstanding this some try to grow roses in poor soil with no manure. There can be no question that many roses die more from starvation than from other causes. If, however, the preparation of the soil is properly made in the beginning, the after fertilization is easy. There are some deep, fertile soils that need little manipulation, but many soils are composed of a few inches of rich top soil, and this is underlaid with a heavy compact, sometimes impervious soil "hard pan."

Our experience has been that roses thrive best with a deep preparation of the soil—excavating the bed, throwing away all stiff clay and impervious material, to a depth of eighteen inches to two feet, and filling the excavation with a mixture of good soil and stable manure. If the soil of the garden is of a clayey nature, the mixture should be from one-third to one-half manure. On the other hand, if the soil is of a sandy nature it is best to place a six-inch layer of the best manure obtainable — cow manure is best— in the bottom of the bed and fill up with soil. The preparation should be made in the fall, in which case fresh manure may be used. During the winter the beds will settle, and planting may be done very early in the spring. The more retentive the subsoil the more imperative it is to provide a drain for the bed, for otherwise you have made a cistern. A subsoil of a sandy or gravelly character will furnish a natural outlet for the water during wet seasons.

A PILLAR OF ROSE

Here the Lady Gay Rose is shown growing about a cedar post, a beautiful garden adornment.

Roses are usually budded upon some strong growing type or species of rose which is known as the stock. The point of connection or union between the top of the desired variety and the stock is usually indicated by a crook in the stem of the plant, and often by the remaining stub where the stock has been cut off. The planter must know about this in order properly to plant the roses. The point of union must be placed three inches below the permanent surface level of the bed. Thus the ugly crook is hidden, the union protected, and suckers are repressed. If planted with any of the stock exposed to light and air, suckers will soon rob the top of all nourishment.

The summer culture of roses is very simple. An occasional light hoeing or raking the surface will keep down weeds and provide a dust mulch in the dry season. The latter is very important if facilities for watering the rose bed are not available.

The original application of manure should be supplemented from time to time by applications of wood ashes, bone meal and liquid manure.

The amount of winter protection will vary with the type of rose grown as well as with the locality. However, all winter protection is based on the practice of cutting back all excessively long shoots to a height of about thirty inches, tying the remaining shoots together so as to make it practicable to hill up the earth about each plant. If the earth can be hilled up about the plant to a height of ten or twelve inches, the best results are obtained. The purpose of this method is to prevent the whipping about of the plants in the winter winds, which often cause a hole in the earth about the stem which fills with water and, if this alternately freezes and thaws, causes serious injury to the plant. Placing a mound of earth about the plant tends to shed the water.

A SPRAY OF EVANGELINE

This is one of the beautiful hybrid roses, a member of the group of single cluster roses. Great progress has been made in developing this type of rose.

North of the latitude of New York City, protection against the effects of extreme cold is necessary. After the ground begins to freeze, a heavy application of strawy manure, coarse litter, forest leaves or evergreen boughs should be placed over the bed between the rose plants. This protection will prevent deep freezing of the soil as well as alternate freezing and thawing during mild periods in winter and during the early spring. From the latitude of Washington, D. C., to that of New York City some protection is required for hybrid tea roses, at least during certain winter seasons. Wrapping the plants with strips of burlap will usually suffice. Much of the winter injury to roses is due to the effect of the sun in February and March. At that time the sunshine is powerful enough to warm up the wood, which in turn becomes too cold at night, and the result is that the bark is killed by the alternation of extremes. Sometimes an apple hamper or a well-ventilated box placed over each plant will give all the protection required.

THE PROUD BARONESS ROTHSCHILD

This beautiful rose belongs to the hybrid perpetual class, a group of the hardiest and most reliable garden roses.

There are many types of roses to select from, and this enables the rose amateur to suit his own taste as well as to have roses under every soil and climatic condition. The hybrid perpetual classes are the hardiest and most reliable garden roses. These give the best display in June, but many varieties also produce good autumn blooms. Among the very best varieties are Frau Karl Druschki, General Jacqueminot, Georg Arends, Anne de Diesbach, Mrs. John Laing, Capt. Hayward, Clio, Paul Neyron and Ulrich Brunner. All of these are especially good for northern rose gardens, since the hybrid perpetual class are very vigorous growers and, as a rule, hardier than the hybrid tea group. There are no yellow shades in this class, however.

The hybrid teas are usually less vigorous growers and less hardy than the foregoing, but they are more continuous bloomers. In selecting varieties, avoid those most frequently spoken of, that is the greenhouse kinds sold in the flower market. Choose those known to succeed outdoors like Radiance, Red Radiance, Jonkherr J. L. Mock, Caroline Testout, Ecarlate, Gruss an Teplitz, Lady Alice Stanley, Kaiserin, Augusta Victoria. Some of the new varieties such as Edel, Rose Marie, and Mrs. Henry Morse are very promising additions to the list.

The "Tea" and Tea Scented roses are even less hardy and are not recommended except for the territory south of Washington, D. C., unless the grower is prepared to take unusual and extra precautions properly to protect them in winter. In the north the best method is take up the plants and pot them up so that they may be wintered in a greenhouse or conservatory, or the plants may be completely buried in sand or light soil in a cold frame outside. This is a troublesome practice, and there are some losses each year. The group contains some very fine varieties, such as Mamam Cochet, White Mamam Cochet, William R. Smith, Lady Hillingdon, and Mrs. Herbert Stevens. The latter is the hardiest tea rose and may be included among the white hybrid teas, of which we have too few good varieties for the garden.

A new class of roses developed during the last few years is the Pernetiana class, which gives us wonderful shades of yellow and orange yellow. Los Angeles Willowmere, Madame E. Herriott, Independence Day, Emma Wright, and Sunny Jersey are all worthy varieties.

The last group of dwarf bedding or garden roses valuable for American gardens is the dwarf "Polyantha or Baby Rambler" class. These are usually small, single or double flowered roses produced in very large clusters. They are not considered of much value for cutting, and therefore they are used as bedding roses, for which they are admirable because of their long blooming season. Some are continuous bloomers and others are only out of flower for a short period, as Marie Pavie, Orleans, Triomphe Orleanais, Edith Cavell, Annchen Muller, Katherine Zeimet, and Mamam Turbat. Some of the new varieties have larger flowers and the up-to-date grower will want Echo (Baby Tausendschon), Gruss an Aachen and Schneekopf.

No rose garden can be made completely effective without some climbers for tall pillars or arches. It is in the development of suitable climbers for American conditions that the rose breeders of this country have made the greatest progress in roses. At the present time we have a most bewildering list of fine single and double cluster roses. Among the well-known standard varieties are Dorothy Perkins, Excelsa, Lady Gay, Lady Godiva, Minnehaha and White Dorothy. Of the singles Hiawatha, Newport Fairy, Evangeline and Paradise are among the very best.

The famous Crimson Rambler, once so popular, is not planted now because it is subject to mildew, but some of the other varieties of its class are free. Ghislane de Feligonde, Mrs. F. W. Flight, Purple East, Rubin and Tausendschon comprise the best of the entire list.

Of all the roses derived from attempts to hybridize our native roses only one is of outstanding importance today.

This is American Pillar, an extraordinarily beautiful, large, single, pink rose. The plant is very vigorous, with large, shining, dark green leaves making it a fine garden subject whether in or out of flower. Prairie Queen and Baltimore Belle, varieties of the same group, are still seen in old gardens.

There are many varieties of the climbing hybrid perpetual, hybrid tea, tea and Noisette classes of roses which are valuable in the south and in California where the Cherokee rose will thrive. Over the greater part of the United States, however, the varieties named above will succeed.

Many persons wish to have a garden of roses, and for this purpose choose a small area surrounded with a hedge of strong growing rugosa varieties such as Conrad F. Meyer, Regina Badet, Madame Lucien Villeminot, etc., or of the hybrid sweetbriars. The native climbing rose, *R. setigera,* sometimes called the Northern Cherokee Rose, is also good for boundary planting. If room is at a premium, a fence covered with climbing varieties will serve the purpose very effectively. Within the rose garden arches and tall posts covered with climbing roses should be freely used to break up the even skyline of the rose beds. Garden seats under arches of roses, pergolas covered with roses, are features for the rose garden. One of the reasons the rose has so great a hold on the affections of mankind is its great adaptability for garden decoration. A skilful use of the advantages of the site, together with a proper selection of types and varieties of roses, will enable anyone to have an interesting and satisfying rose garden anywhere within the limits of the United States.

To the garden lover there is always satisfaction in the growing beauty that he or she has helped to be. When this garden boasts beautiful and healthy rose bushes, with their delicately petalled blooms and delightful fragrance, there is an added joy of accomplishment for the gardener which in itself can be considered ample reward. Truly, we are all for roses and there may well and easily be, roses for all.

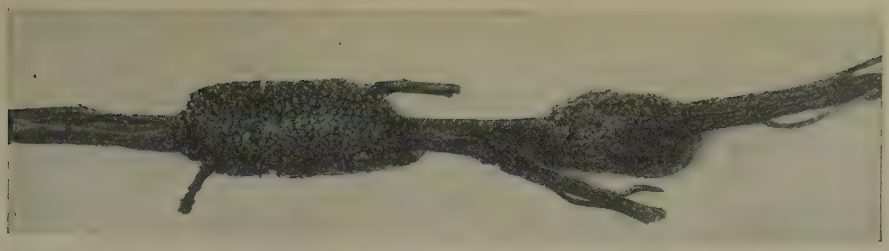
SOUVENIR DE GUSTAVE PRAT

Here we have one of the most beautiful of the hybrid tea roses. This class includes many that are less hardy but are often more continuous growers.

A Tree with a Forty-foot Waistline

NEAR the Oregon Caves in Josephine County, Oregon, stands a Douglas fir which has a circumference of thirty-nine feet, eleven and one-half inches. The tree stands on a slope and the measurement was taken at two feet above the ground on the upper side and ten feet above on the lower side. From the illustration it can be seen that the tree has but little of the characteristic butt swell of the old Douglas fir. The Cavemen, a "booster" organization of Grants Pass, has dedicated the tree to their order. The bronze tablet, shown above the lady's head, is the Cavemen's evidence of ownership. The tree is one of the largest of its kind and has witnessed the passing of many centuries. The timber that could be cut from it would build a fair-sized house, but fortunately it is being saved in all its noble and ancient glory.

We wish that this example might be followed by many others in various parts of the country, since many notable trees, the preservation of which would be an inspiration, doubtless merit like attention.



A POTENTIAL SOURCE OF A LOT OF DAMAGE

Here are the egg-masses of the tent caterpillar, which will, unless they are destroyed, hatch out between two and four hundred hungry caterpillars.

Tent Caterpillars and Their Control

By A. B. Champlain

THERE are but few insects better known to persons interested in fruit trees, shade trees and hardwood forests than the different kinds of tent caterpillars. At times the outbreaks of these destructive creatures assume serious proportions, and the necessity for artificial means of control becomes apparent. Natural enemies such as parasitic insects, birds and diseases play an important part in helping to keep in check the tent caterpillars and other injurious insects, but it is too much to hope that Nature alone will control our pests. Often we must combine with Nature, supplementing her efforts by our own, in an alliance that will insure us greater success in a war against them. Fortunately there are a number of excellent methods whereby this may be accomplished in reference to tent caterpillars, all depending upon a knowledge of the habits and mode of life of the species. Let us, therefore, review the interesting life history of some of these insects.

The tent caterpillar is one of the undesirables of the insect world. Now is the the time to declare war on it, so Mr. Champlain of the Pennsylvania Department of Entomology was asked to prepare this article. It is a password and general orders for the battle.

Tent caterpillars belong to a family of silk spinners closely related to the "silk worm" of commerce. They live in colonies, are social in their habits, and spin a more or less conspicuous nest or tent of silk upon the branches and foliage of various species of trees where they feed. The American or apple tree tent caterpillar (*Malacosoma americana*) is a very common species in the east, where the caterpillars often become numerous enough completely to defoliate many kinds of orchard and shade trees, and when abundant will also attack forest trees. It seems to prefer wild cherry, which was probably its natural food plant. Such trees serve as centers of infestation.

In the regions west of the Rocky Mountains it is replaced by several other species, all closely related and with similar habits. The forest tent caterpillar (*Malacosoma disstria*), another related species, is equally common and destructive, but prefers to eat the foliage of forest trees such as linden, oak, ash, maple, poplar, birch, elm, and many others, but it will also attack fruit trees.

A LARGE TENT

This is built on a wild cherry, a tree that seems particularly to the caterpillar's liking.

The eggs from which tent caterpillars hatch are laid by the parent moth in wonderfully neat, ring-like masses around the twigs. These egg-masses are coated with a thick, glue-like substance which serves as a protection against moisture and cold, also holding the eggs safely in position until it is time for them to hatch. When the leaves have fallen and the twigs are bare, the egg-masses may easily be seen after a little practice, and here a method of control suggests itself. In the case of orchards and smaller trees we may nip the evil in the bud by removing and destroying the egg-masses during the winter months. As each ring or cluster of eggs contain from two to four hundred eggs, the possibilities for doing good control work are evident, and the job of destroying the caterpillars the following year is lessened. Boy Scouts and similar organizations would prove valuable aids in this work, and a small bounty or prizes offered for certain quantities would stimulate interest in such a project.

About the time, or just before the first buds begin to open in the spring, the eggs hatch, and the little caterpillars, after feeding somewhat upon the glue-like covering of the egg-masses, start out together in search of green food.

In the case of the American tent caterpillar, which we will take as an example of the group, the newly hatched caterpillars select a fork not far from the egg-mass and form a small nest for themselves. By selecting a fork or crotch they can utilize the diverging twigs as tent poles around which they spin the silken nest, which is usually

enlarged as the caterpillars grow. The prominent and unsightly tents or nests of this species are often a foot or more in diameter, with several openings or doors. The caterpillars feed upon the leaves from the twigs nearest to the nest, returning to the tent for shelter when not feeding and on cold or stormy days. These nests or tents may easily be removed when small and the caterpillars killed, and it is not a difficult matter to tear out and destroy the larger nests, which should be done when the caterpillars are within.

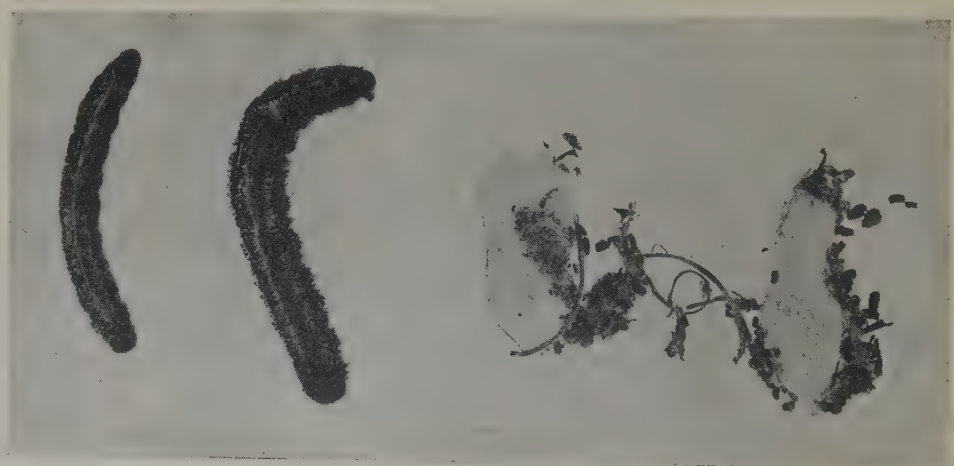
In orchards which are well sprayed with arsenate of lead to poison pests such as codling moth and curculio, tent caterpillars are seldom troublesome. The young caterpillars all succumb to the poison before they can do much damage. The older caterpillars are more difficult to kill in this manner. Larvae or caterpillars, as they grow, cast off their skins from time to time. When the tent caterpillars reach their full size they are about two inches long with a cylindrical body, lightly clothed with yellow hairs of varying lengths. They are black in color with a white stripe down the middle of the back. Along the sides are small, irregular, yellow streaks and a row of oval, pale blue spots.

A TENT THAT IT IS WELL TO FOLD AND STEAL AWAY

Using the diverging twigs of a crotched limb as tent poles, the caterpillars build their homes, using them as a base for their feeding operations on surrounding foliage.

Full-grown caterpillars leave their nests or home in the trees during June or thereabouts, depending on latitude, and proceed to scatter in all directions, each searching for some convenient sheltered spot in which to spin cocoons. Some place them under loose boards or stones, others on the side of a house or in a fence corner or any similar protected place. When satisfactory nooks have been found they spin spindle-shaped cocoons of white silk about themselves, attaching them firmly to the object upon which they rest. When finished they fill the spaces between the silken threads with a fluid that quickly dries and forms a sulphur yellow powder. Inside the cocoons they change their form from the caterpillar to the pupal and resting stage, which lasts from ten days to two weeks or more. At this time many of these cocoons may be gathered and burned, or, if placed in a box covered with a wire netting in which the mesh is about three-sixteenths of an inch in size, any parasites will escape to continue their beneficial work, while the parasite-free moths, too large to get through the mesh, may be destroyed in this manner.

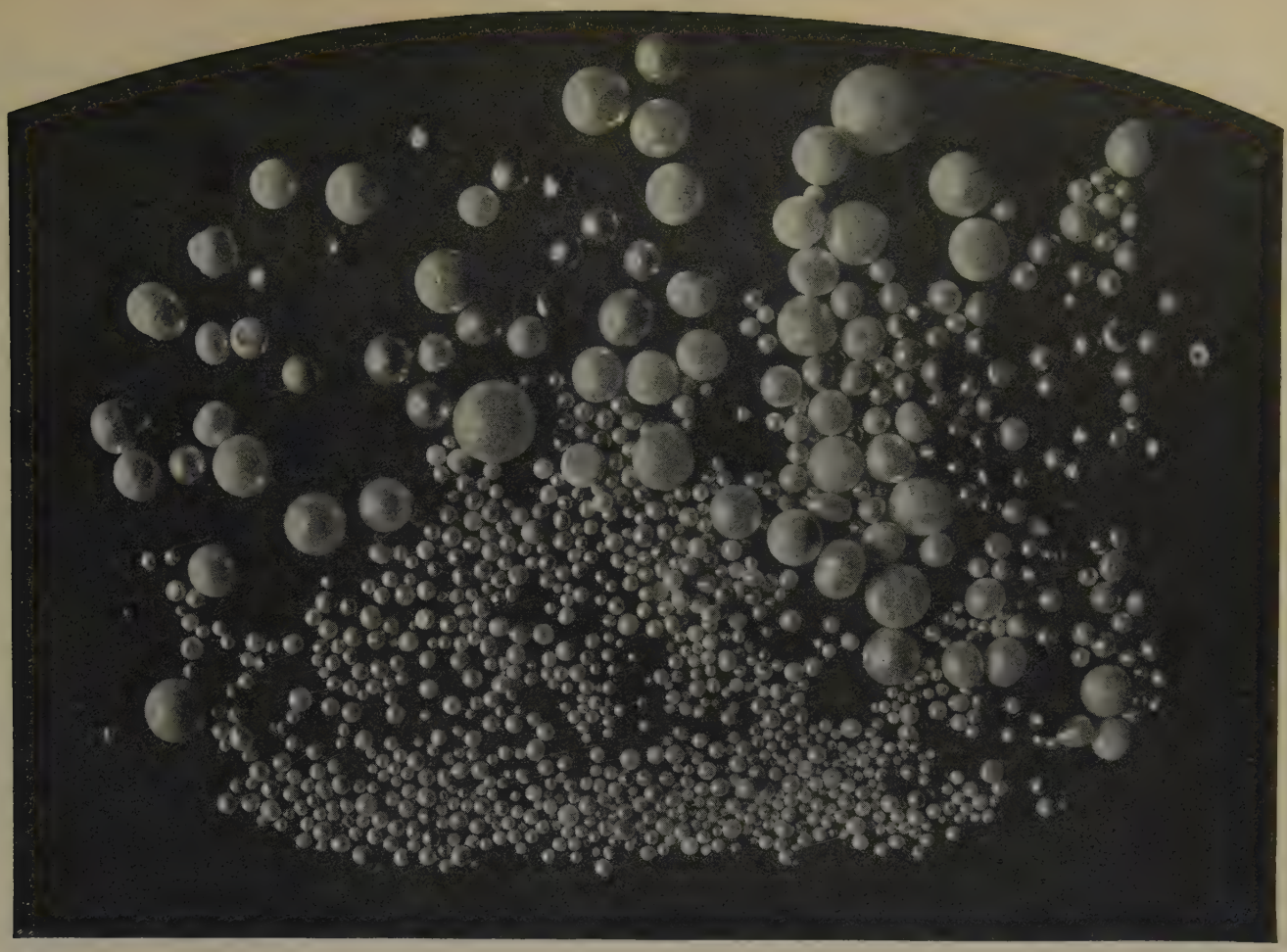
Moths of the tent caterpillar are the adults of the species. The females lay the eggs, and then the trouble starts. The females are considerably larger than the males and may be further distinguished in that the males have feathered antennae or feelers. They are both of a dull reddish color with perhaps a brownish tinge, and with two oblique pale stripes near the middle of each forewing. They are stout-bodied insects and have a wing expanse of from one to one and one-half inches.



TENT CATERPILLARS AND COCOONS

These cocoons are built in some convenient sheltered spot but they may be gathered and destroyed or kept under fine netting that will allow their parasites to escape.

Among the various control measures mentioned we recommend hand collecting as the most important.



PHOTOGRAPH CORNELIA CLARKE

LIKE TINY BALLOONS OF LIGHT DANCING AGAINST THE BACKGROUND OF THE NIGHT

Here are two thousand dollars worth of pearls taken from fresh-water mussels of the Mississippi River. Most of them are the regular spherical pearls, but here and there one of odd shape may be noted.

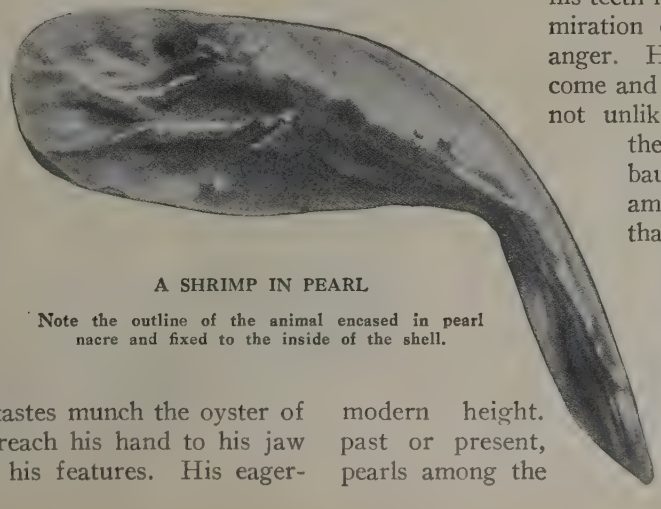
PEARLS—JEWELS OF ANTIQUITY

By PAUL BARTSCH

Curator, Division of Mollusks, U. S. National Museum

HOW MANY of my readers really know what these beautiful precious gems called pearls are and how they came into being? Few, yes, probably very few, know about their origin. This is the more surprising because pearls were among the earliest jewels prized by man, and it is more than possible that they may have been the very first.

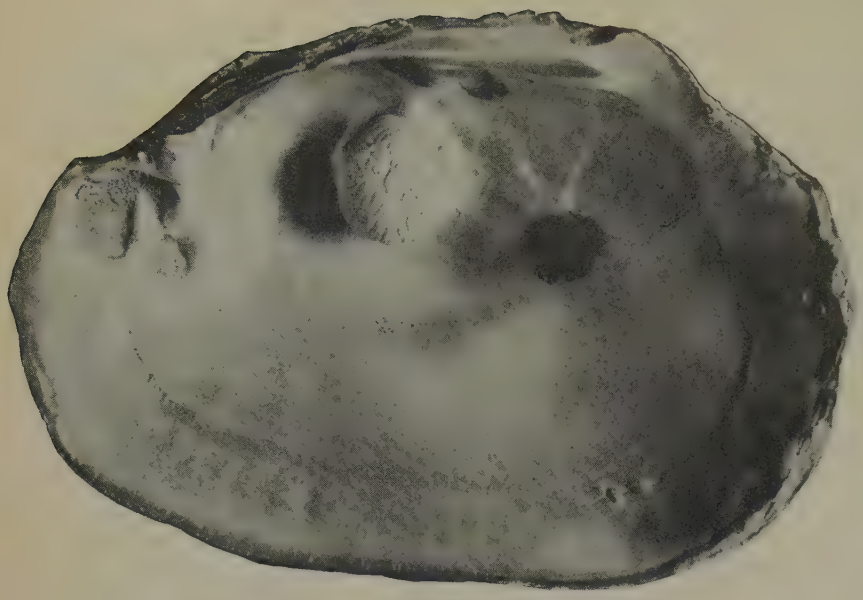
I can easily see the time when man, ancient, primitive man, as yet but little removed from his fellow-creatures in habits; still largely a brute, without dress or tools, was prowling along the margin of streams in search of food. I can picture him stooping down to pick up a succulent clam, crushing its thin shell with a blow from a stone. I can see him extract the luscious meat, transfer it, still dripping, to his mouth, and munch it even as men of more specialized tastes munch the oyster of our day. But, alas! I see him reach his hand to his jaw with an expression of pain upon his features. His eagerness to satisfy the craving of his stomach and palate had caused him to forget caution, and his teeth have struck the hard sphere of a pearl. He looks at it in anger, probably swearing in his way at the hurtful thing. But even while he rolls it in his hand, its iridescent luster changes his look of resentment. It is more than likely, too, that the pain in his teeth has subsided, and wonder and admiration of the pretty thing replace his anger. He probably calls to his mate to come and see, and she plays with it. It is not unlikely or impossible that through their admiration of this pretty bauble sprung that impulse of amassing and hoarding the things that we now call precious.



A SHRIMP IN PEARL

Note the outline of the animal encased in pearl nacre and fixed to the inside of the shell.

Pearls have been found in the burial places of ancient man. They have assumed a progressively greater importance as civilization advanced to its modern height. There is scarcely a people, past or present, which did or does not count pearls among the most valued of its possessions.



ROSE PEARL IN A FRESH-WATER CLAM SHELL

Little water mites attack the gills of our clams and the mollusk encases them as in the picture above, building a case of pearl about them.

Although pearls have an ancient history, the beliefs of how they are produced have been largely a matter of the imagination. These views have resulted in the production of some of the prettiest fairy tales that human imagination has achieved. It seems almost a pity that these must be replaced by the prosy findings of the science of today.

Some of the ancient tales date back for more than 5,000 years in Chinese history, where we are told that pearls were used to adorn not only favored human beings, but the images of their deities. One of their legends tells of a certain pearl so brilliant that its radiance made it possible to cook rice a hundred yards away. Mystic qualities are even now ascribed to pearls by the Chinese, for we find them prescribed by their Old School doctors, crushed to a powder or dissolved in acid, as medicine.

They are mentioned in the Vedas, while the Old and New Testaments, the Talmud and the Koran all exalt them as symbols of beauty and purity. The Persians, long before Christ, valued them, as is shown by their medals and coins and actual pearls found in their burial places.

The Romans were particularly fond of these gems, and Caesar, to stop race suicide among the better classes, issued a decree that no woman without husband or children, under 45 years, might wear pearls.

During the Middle Ages they played an important part in the ornamentation of such religious objects as the containers of relics, statues, and vessels. After the fourteenth century they assumed an enormous rôle among the precious possessions of the nobility of Europe and the East. It is recorded that Catherine de Medici, when married to the Duke of Orleans in 1535, brought to France, among her other treasures, the most precious pearl then known in all of Europe.

To give you an idea of their present valuation, I may say that a few years ago a single string of pearls sent from Paris to London was insured for 3,000,000 francs.

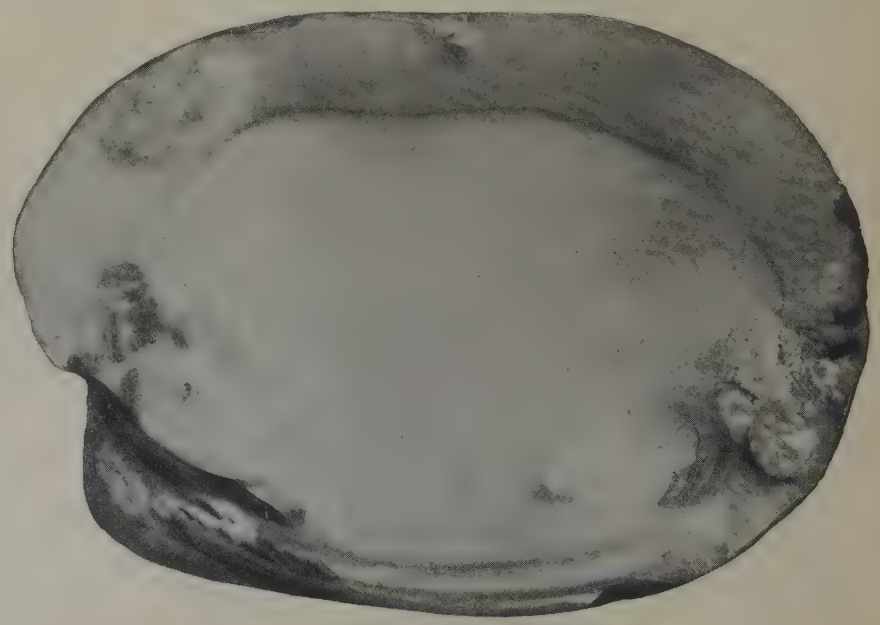
While pearls were probably first obtained from the fresh-water clam, the real pearl fisheries developed on the shores of oceans. The oldest fishery is probably that of the Persian Gulf. The next oldest is at Ceylon and the Indian Ocean, followed by those of the Red Sea, the Mediterranean and those of the New World, more particularly Panama, the Gulf of Mexico and the West Indies.

What are pearls? One poet says they are "the tears of a goddess dropped into the sea —caught to the heart of the pearl oyster and there treasured as the purest gem of the ocean." Another says, "The air gives us the rainbow; the meteor fire; the earth the ruby, but it is the sea that yields the pearl!"

And now let us see what science tells us. "The most beautiful pearl is nothing more than the shining sarcophagus of a worm," said Dubois, and he is correct. The most perfect spheres usually begin in that way, as can readily be shown by cutting sections of a pearl and examining them under the microscope. All true pearls are produced by secretions from mollusks. The precious ones come chiefly from the pearl oyster, the fresh-water clams, the abalone and in a lesser degree from all the other pearly shelled mollusks. The common oyster, the clam and all the other nonpearly mollusks may produce pearls, but these are without value since they lack the pearly lustre. I must mention here an exception, namely, that of the pink conch pearls obtained from the nonpearly conch shell which also bring high prices.

Pearls, whether of value or without it, are the result of an effort on the part of the mollusk to seal up an enemy, or an irritating substance that has found its way inside of the shell, or has bored into the flesh of the animal. The most perfect spherical pearls are usually started by the baby stage of a fluke worm that must live for part of its early life in some mollusk or die.

These young worms burrow into the flesh of the mollusk and live upon it until they have reached a certain amount



EACH PEARL IS A HURT OVERCOME

The valve of a fresh-water clam in which the mollusk has built a pearl about some foreign substance that has gotten within the shell.

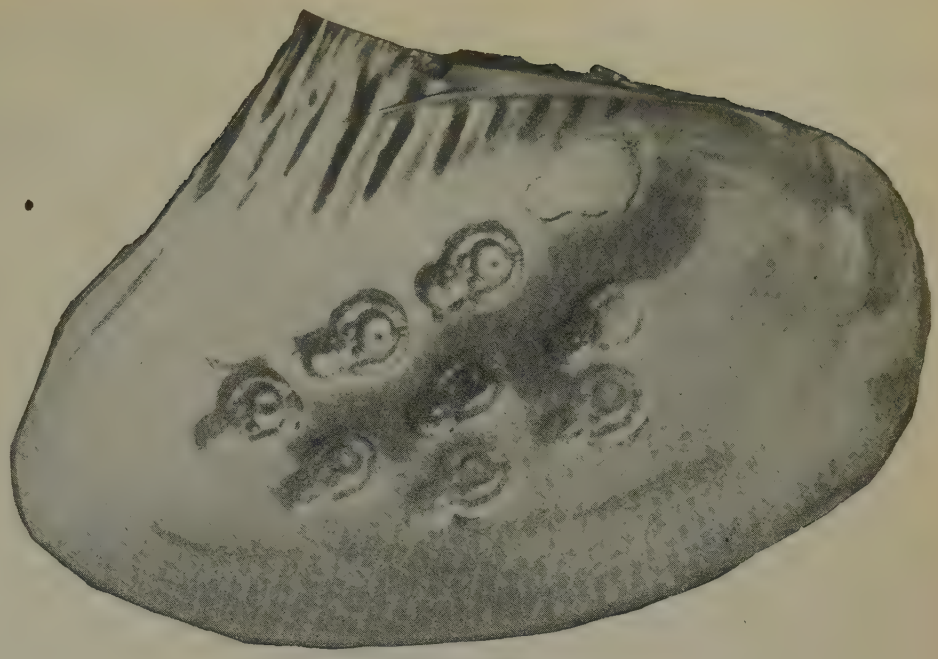
of growth. The mollusk, to overcome this undesirable parasite, attempts to lock it up by secreting a shelly capsule around it, and if successful, it kills the parasite that way. But, having once begun to secrete nacre—the shiny substance of the pearly shell—it can't stop, and so it puts layer upon layer as thin, if not thinner, than a thin onion skin around this nucleus, and thus the pearl continues to grow until the mollusk dies or some lucky fisherman captures the prize.

Another way in which pearls are formed, and this is usually the history of the irregularly shaped ones known as "baroques," is that a grain of sand or some other hard foreign substance is accidentally forced into the mantle cavity of the mollusk. This will be promptly walled off against the inside of the shell and added to layer by layer, the smooth coating reducing the irritation.

Sometimes little water mites related to our chiggers attack the gills of our fresh-water clams in large numbers, and these usually cause the irregular pearls known as rose pearls. Then again we may have a small fish or crustacean dart into the mantle cavity seeking protection from some pursurer. This, too, will be walled off and fixed to the inside of the mollusk shell and covered with nacre until it develops into a pearl with the shape of the fish or shrimp. But no matter what its shape, whether a mere blister, baroque, rose pearl, or a perfect sphere, each pearl represents a hurt overcome; therefore joy—which is another reason why we should love them.

One of the oldest records of an ornament, I am told by a leading student of human culture, is a necklace consisting of a number of pieces of cut and perforated pearl shell and a few perforated teeth.

From this it is but a short jump to the rounded iridescent pearl button or bead that can be purchased in almost any town today. These pearl beads are also beautifully sparkling, sometimes even more so than the plain, uniformly pearl gray spheres that command the fabulous prices. But anybody can afford a string of pearl buttons—therefore we do not care for them.



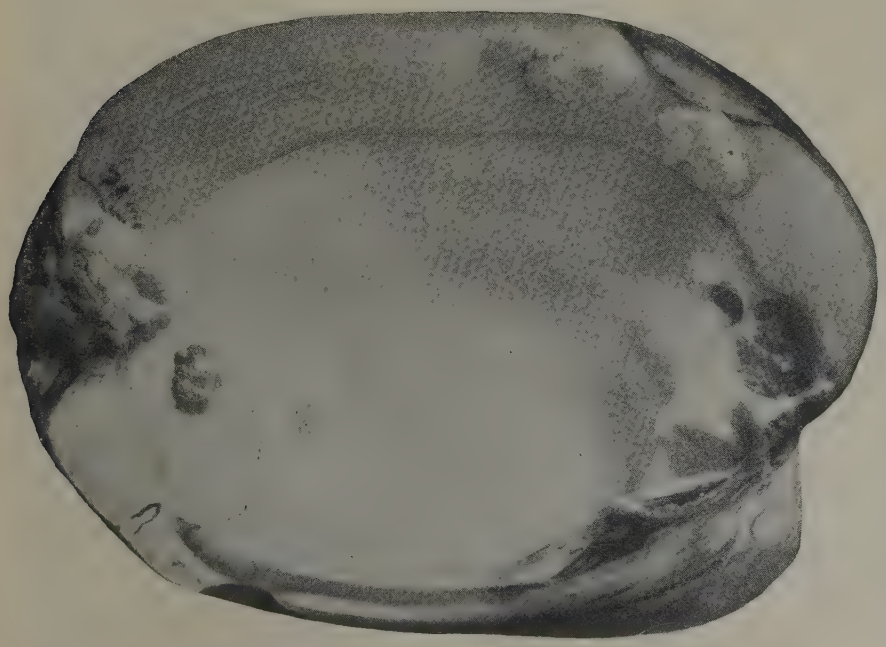
BUDDHA DONE IN PEARL

The priestly followers of that teacher used to insert little images within the mollusk's shell and then point to the miracle of Buddha's power.

Perfect shape, size, uniform color, and even luster are the criteria that determine the value of the pearl. So from the long ago man has been desirous of wresting from Nature the story of pearl culture. In these efforts, China and Japan have been in the lead by centuries.

In the National Museum at Washington are some specimens of shells of a huge, pearl fresh-water mussel at home in those countries, on the inside of which are numerous little images of Buddha, all done in pearl. We are told that these are sold to or bestowed upon pilgrims visiting certain sacred shrines as miraculous manifestations of that great teacher—and that these gems are highly valued by the people of the Orient. These little images are really the forerunners of our cultural pearls—the term "cultural pearls" being the trade name for the man-induced, or artificially grown pearls.

The method used by the Buddhist priest in producing the pearl images was to insert a small wooden wedge between the two shells of the animal, when these were open, to keep them from closing. All mussels can only open their shell a little way, just enough to extend the foot by means of which they slowly plough through the mud of the bottom, and two tubes—one bringing in water loaded with microscopic animals and plants upon which the mussel feeds, and oxygen for breathing, the other carrying away the waste water and refuse. The wedge once quickly and carefully slipped in makes it possible to work in the interior. To understand fully the methods of



IRREGULARLY SHAPED PEARLS ARE "BAROQUES"

The mollusk walls off the foreign substances that have gotten within its mantle, adding layer upon layer of smooth coating, reducing the irritation.

artificial pearl growing, you must know a little about the structure of a mussel, for all the mollusks used for cultural work today are bivalve mollusks. All live in water, some in fresh water, others in the ocean. These creatures much resemble a book in arrangement of parts. The two shells that protect them can be compared to the cover of a book. Inside of these shells we find the mantle which we may compare to the first and back pages of the book, but these mantle sheets are grown fast to the outer edge of the shell. It is the mantle that secretes the shell and adds to it. Inside of these we have two more pages in front and back, the gills, which perform the breathing and also capture the food—and then we have the body in the middle between these four gills.

Now when the Oriental wished to produce pearl images of Buddha, after inserting his wooden wedge, he carefully forced the mantle for a little way from its attachment to the inner bottom edge of the shell. Then he took a number of small images of Buddha stamped in tin, upon the under side of which he placed some sticky substance—probably a bit of beeswax—and, after carefully lifting the edge of the mantle, he inserted them and fixed them row upon row on the inside of the shell.

PHOTOGRAPH CORNELIA CLARKE

MORE PEARLS FROM MISSISSIPPI CLAMS

Some three thousand dollars worth of pearls showing a variety in the formation of the jewels.

The job was done! All that was necessary now was to return the mussel to the pool where it would shortly repair the injury done to the edge of the mantle and overcome the irritation produced by the irregular surface of the tin images by coating them with nacre. So after a few months, a year or more, when these mussels were taken from the pools, killed and opened, the images would be found fixed to the inside of the shells just as they were placed, but now nicely coated with shining pearly nacre—miraculous manifestations of the Great Buddha, and as such highly prized by the devout worshippers.

This introduction of foreign element of various kinds has been practiced for a long time by many peoples, but the product has usually been inferior because metals used as a nucleus for such work usually cause the nacre to become stained and therefore imperfect.

In the National Museum there is a shell of a huge American fresh-water mussel with pink nacre. Into this, under the right side of the shell, was inserted a large oval piece of mother-of-pearl, almost the size of a pigeon's egg. This has been beautifully covered with pink nacre, but unfortunately it was not left in the water long enough so that a thin film only was deposited which has since cracked in places, as shown by our figure. In the left valve a piece of beeswax was inserted. This was evidently crushed in the operation which has resulted in the irregular rough formation, shown in our illustration. These experiments were made in the middle of the last century by Col. T. G. Lea, brother of the famous Isaac Lea, the foremost student of pearly fresh-water mussels.

In Japan the cultural pearl industry has assumed great proportions. Their early efforts resulted in the formation of hemispheres and buttons. Polished pieces of mother-of-pearl, that is, pearl shell in perfect hemispheres or almost spheres, were introduced into pearl oysters much in the way in which the little tin images of Buddha were introduced, and the mollusk shells returned to the sea for further development and later gathering.

Many such cultural pearls are now on the market. They are very beautiful, but they are not the perfect spheres one finds strung on a chain of pearls. They require a metal setting that will hide the side by which they were attached to the inside of the shell that produced them.

More recently, I am told, the Japanese workers have produced perfectly spherical cultural pearls. Their method of so doing is kept a secret. It is probably either the introduction of a spherical mother-of-pearl nucleus into the flesh of the animal by a surgical operation or the introduction of an almost solid fluid probably mixed with mantle cells into the flesh by means of a hypodermic needle.

"What about the value of the string for which I paid a fortune," you may ask. Don't worry! Science has shown a way to tell the natural from the cultural pearl. By the use of X-rays the nucleus used for the cultural pearl will be revealed, and since the price is intimately associated with the rarity of the thing, the value of your string should not be involved any more than it was when man devised machinery that would turn a perfect sphere from a piece of pearl shell—which, no matter how lustrous, still shows the grain.

Practically nothing has been done in our country in the way of cultural pearl production. This is the more surprising because in the fresh-water streams of the United States are to be found the greatest number and the finest species of fresh-water pearly mussels in the world. This splendid material should certainly tempt American ingenuity and enterprise to wrest from the Orient the leadership in an undertaking which certainly produces great returns.

PHOTOGRAPH J. G. ALLEN

THE COYOTE HAS SOME TRAITS TO ADMIRE

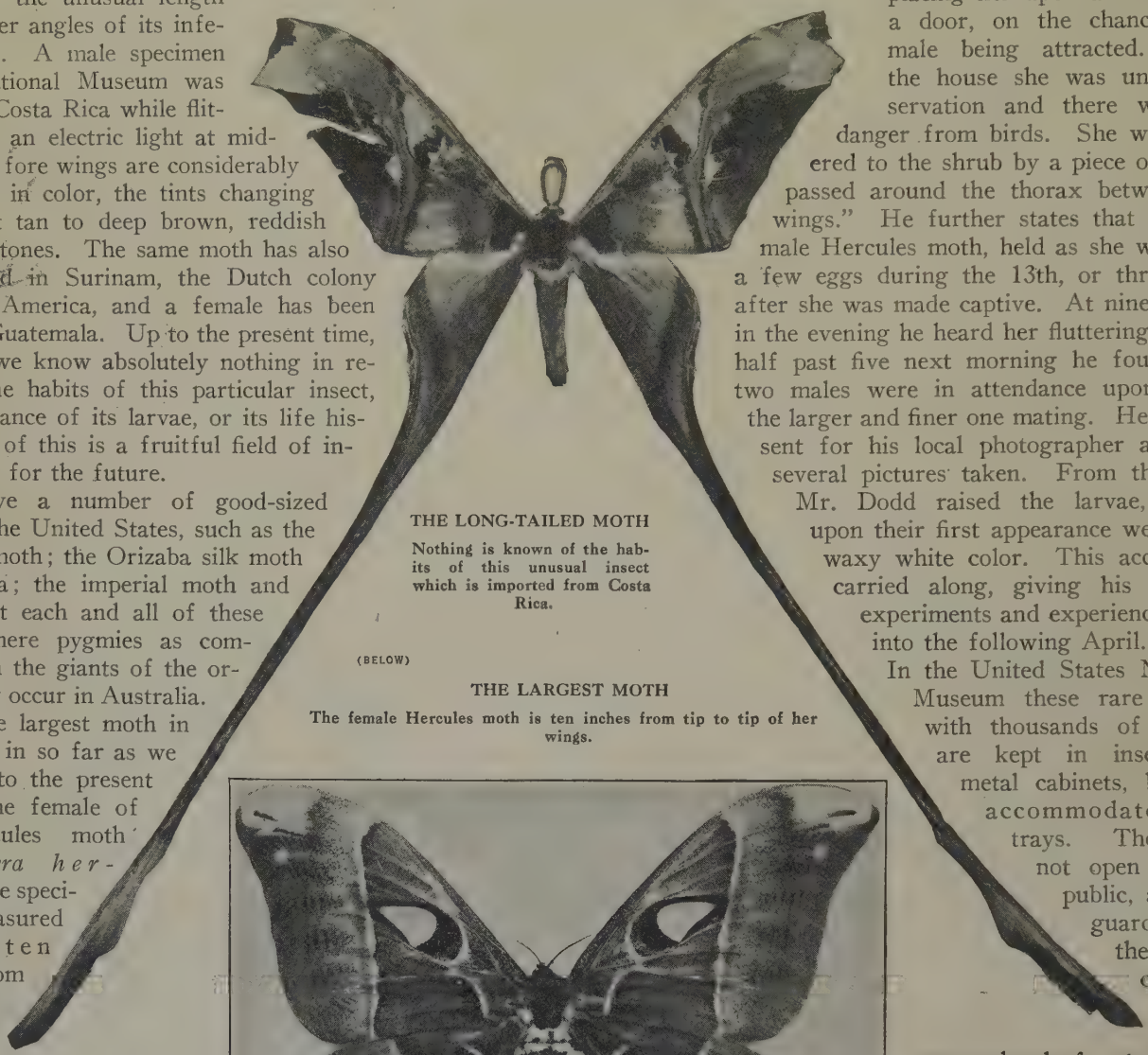
Bright, resourceful and keen, this wanderer of the plains is unfortunately usually known as a sneaking fellow. Here he sits for a charming and friendly picture.

Some Giants of Mothdom

THE United States National Museum possesses a collection of moths and butterflies from every part of the world. Among the strangest members of the moth family is one that might well be named the long-tailed moth on account of the unusual length of the lower angles of its inferior wings. A male specimen in the National Museum was caught in Costa Rica while flitting about an electric light at midnight. Its fore wings are considerably variegated in color, the tints changing from light tan to deep brown, reddish and black tones. The same moth has also been found in Surinam, the Dutch colony of South America, and a female has been found in Guatemala. Up to the present time, however, we know absolutely nothing in regard to the habits of this particular insect, the appearance of its larvae, or its life history. All of this is a fruitful field of investigation for the future.

We have a number of good-sized moths in the United States, such as the Cecropia moth; the Orizaba silk moth of Arizona; the imperial moth and others; but each and all of these are but mere pygmies as compared with the giants of the order as they occur in Australia.

Now the largest moth in the world, in so far as we know up to the present time, is the female of the Hercules moth (*Coscinocera hercules*). One specimen measured nearly ten inches from tip to tip of its superior wings, but it is said that considerably larger ones have been taken—even larger than the Atlas moth of the East Indies (*Attacus atlas*), of which Kirby says that "the largest specimen in the British Museum measures eleven inches and three-quarters across the wings." The male Hercules moth measures a little smaller than the female and is an entirely different appearing insect. Its colors are brown, tan, white and black, with some red. It has transparent spots in its wings, as has also the female; but the latter is principally a tan and rich brown insect, with black and white emarginations. In writing about this Hercules moth from Kuranda, Queensland, Australia, Mr. Dodd remarks: "For some years I have been breeding out the moths of this species . . . and on the 10th of December, a female emerged with crumpled tails, so I decided upon placing her upon a shrub near a door, on the chance of a male being attracted. Near the house she was under observation and there was less danger from birds. She was tethered to the shrub by a piece of string passed around the thorax between the wings." He further states that this female Hercules moth, held as she was, laid a few eggs during the 13th, or three days after she was made captive. At nine o'clock in the evening he heard her fluttering, and at half past five next morning he found that two males were in attendance upon her—the larger and finer one mating. He at once sent for his local photographer and had several pictures taken. From the eggs, Mr. Dodd raised the larvae, which upon their first appearance were of a waxy white color. This account is carried along, giving his various experiments and experiences, well into the following April.



THE LONG-TAILED MOTH

Nothing is known of the habits of this unusual insect which is imported from Costa Rica.

(BELOW)

THE LARGEST MOTH

The female Hercules moth is ten inches from tip to tip of her wings.

In the United States National Museum these rare moths, with thousands of others, are kept in insectproof metal cabinets, built to accommodate the trays. They are not open to the public, and are guarded with the utmost care, being reserved only for the inspection and use of scientists and researchers. Many of these specimens are truly marvels in the matters of form and coloration.

Few moths are finer than some of our local species, such as the Luna moth which one may see in July flying about the electric lights. It is a beautiful light green with a white body and long tails. It flies later in the evening than most of our large moths and is active nearly all night. Another fine moth is the Polyphemus, light brownish, with large blue eyes on the hind wings. These, and the Cecropia, are more common than many suppose. They are beautifully fashioned.

BUDS OF THE NORWAY MAPLE

What do the buds tell of the character and family of the tree? The author of this article reveals their story here. Experienced as a teacher of Nature in Cambridge and Boston, Massachusetts, she has told an entertaining and instructive story

TREE BUDS—THEIR STORY

By Mary F. Robinson

(PHOTOGRAPHS BY C. W. ROBINSON)
(ILLUSTRATIONS ABOUT TWICE NATURAL SIZE)

SILVER MAPLE FLOWER BUDS

BUDS OF THE SYCAMORE MAPLE

TREE buds have as much individuality as do the leaves or bark. Those of one tree group or family are, as a rule, strikingly different in appearance from the buds of another. Even buds of one kind have features which may distinguish them from those of another in the same family. Because of marked dissimilarities in the characteristics of their buds, we may, on our early spring hikes, easily recognize most of the common trees such as the maples, ashes, elms, oaks, and hickories.

The bud characteristics to be considered are: Position on the twig, color, shape, and size, and the arrangement, number, texture, and hairiness of the bud scales. These last characteristics are much more easily studied with the magnifying glass. From their position on the twig, buds are designated as terminal or lateral. On the same tree we may find that some of the buds contain only embryonic leaves, while others contain just flowers. The former are known as leaf buds; the latter, which are usually larger and frequently of different shape, are called flower buds.

On each maple twig, no matter which kind, the first pair of lateral buds, always opposite in position, comes so close to the terminal that there is a group of three buds at the end of the twig. No other common trees have that arrangement except the ashes, but the buds of the latter are so different in shape that there need be no confusion. The terminal of any maple twig is larger than the lateral buds and is always pointed. Silver and red maples sometimes have extra flower buds clustered at the nodes and also near the end of the twig, but in the center of the end cluster will be found the three typical end-of-twig buds of this group.

STRIPED MAPLE AND SUGAR MAPLE

Buds of the black sugar maple are dull brown, slender, and very pointed. Their scales are small, prominent, overlapping, free from hairs, and fewer in number than the scales of the sugar maple buds. All buds of the box elder are pointed, dull reddish-brown, and entirely covered with two scales that are so downy that swollen buds in the bright sunlight resemble tiny pussy willows. The large, green, pointed buds of the sycamore maple are the most conspicuous of the maples, for they are smooth and shiny. Each one of these has four prominent outside scales. Striped maple buds have two red scales which fit closely together, and are covered with a fine down, the tiny hairs of which show under the magnifying glass. The terminal bud, which is slightly four-sided, has a long base resembling a stalk.

On the ends of Norway maple branches, pairs of short twigs about half an inch long are common. Each twig has a large terminal but very small laterals which might be taken for scales. These buds are golden brown, elliptical, and flattened with four hairy-edged outer scales. Red and silver maples both have pointed leaf buds and stouter rounded flower buds, all of which are red. But silver maple flower buds are slightly larger, and we find them more abundant around the terminals. Their outside scales, more hairy than those of the red maples, are longer, usually reaching the apex and almost enclosing the bud. Some silver maple twigs bear only leaf buds. These are more pointed and duller red in color than those of the red maples.

We may be reasonably sure we have found a maple tree if there are three buds at the end of each twig, a pointed terminal with two smaller

BLACK SUGAR MAPLE AND BOX ELDER

RED MAPLE AND SILVER MAPLE BUDS

BUDS OF SOME COMMON POPLARS

Most poplar buds are gummy and fragrant. Left to right here are Balsam, Cottonwood, Aspen and Balm of Gilead.

buds except the stout flower buds of the white elm diverge from the twig at an angle of about forty degrees.

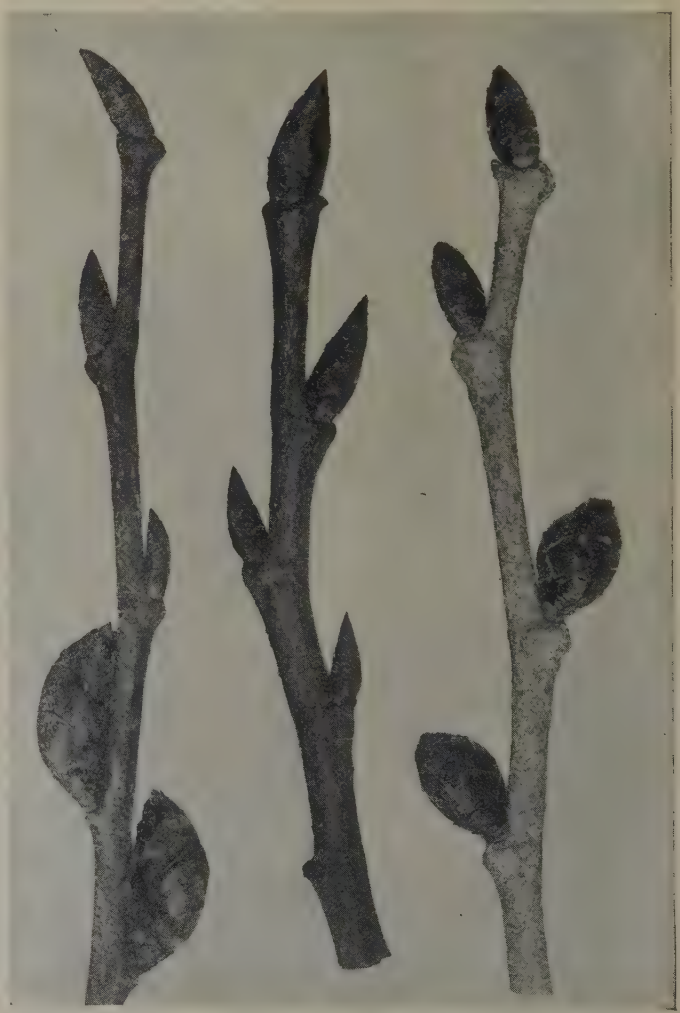
White elm buds are most conspicuous on the tree because of the contrast in size and shape between the leaf and flower buds. Each little twig in the feathery top when silhouetted against the clear blue winter sky shows, near the end, slender, pointed, diverging leaf buds and farther back stout humped flower buds which hug the stem. On close inspection the latter appear a rich golden brown, while the leaf buds are darker and duller. The dark brown, sharp pointed buds along the cork elm twig all diverge and are similar to each other in shape. Slippery elm leaf and flower buds differ from each other in size and shape as the white elm buds do, and they are arranged in the same way—leaf buds near the end, flower buds farther back. We need not confuse the twigs of these two trees, however, for the flower buds of the slippery elm are very hairy and, although they are comparatively stout, they are symmetrically rounded and diverge from the twig. Then, too, the leaf buds of the slippery elm are less pointed, and darker brown than those of the white elm.

opposite laterals close to it. Ash buds at the ends of twigs are similar in their arrangement to maple buds. There is a terminal adjacent to which is the last pair of opposite laterals, the three so situated that their bases are nearly on a level. But the ash buds, always blunt or rounded, are enclosed in pebbly or bristly scales.

Red ash buds are covered with two rough scales which fit closely together at the top. These dark-brown buds appear almost black in contrast to the gray stems. The white ash terminal is about three times the size of that of the red and has four scales, two large dark-brown ones, pebbly under the magnifying glass, which end in tiny points at the apex, and two small golden-brown scales which partly cover, at the base of the bud, the space between the two large scales. The small, plump laterals, also rough under the magnifying glass, are light brown at the base and darker brown near the apex. Blue ash buds are easy to distinguish. Each terminal has two long, prominent scales, one each side of the bud, the tops of which resemble immature leaves tightly folded between the side veins. All the buds are tawny, and the scales under the magnifying glass seem to be thickly covered with tiny bristles. The brown buds of the green ash are pebbly like some of the other ashes, but the terminal has two scales, the points of which look much as though they had been cut or filed off so that there are two little flat surfaces at the top.

We may distinguish an ash by the three rounded or blunt, pebbly or bristly buds, with bases nearly on a level, situated at the end of each twig. We may know each kind of ash by close observation of the scales of the terminal. The ashes and the maples are two of the three groups of large trees whose lateral buds are opposite in their arrangement.

Elm buds are neither grouped nor close together. They are arranged along the twig on opposite sides, one bud at a node. There is no terminal. The buds are more or less rounded, about one-quarter of an inch long, and protected by two tiers of closely overlapping hairy scales. Almost all elm

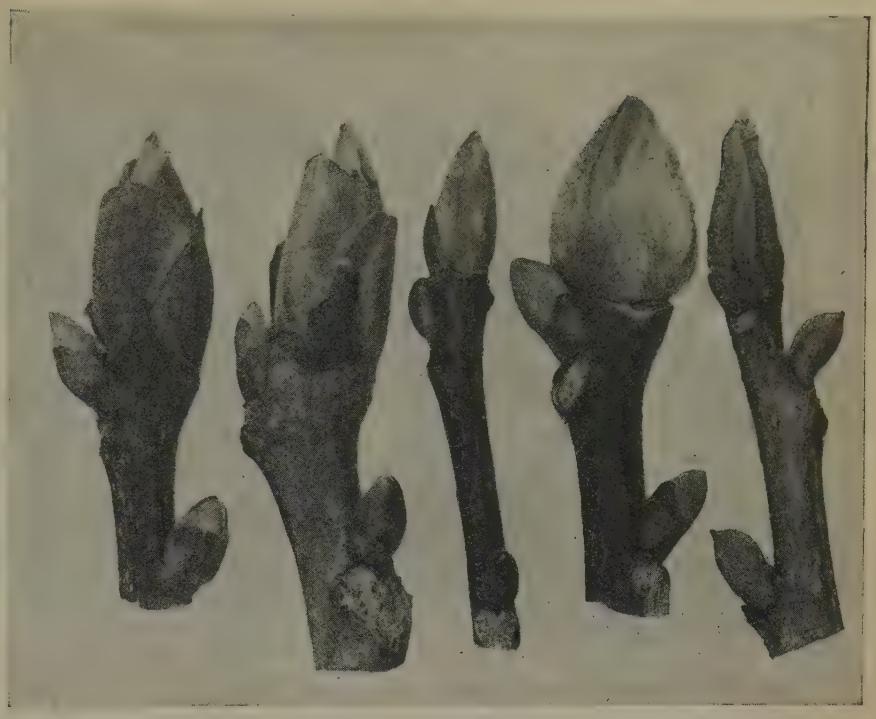


BUDS OF COMMON ELMS

Elm buds are on opposite sides of the twig, one at a node. From left to right are White, Cork and Slippery Elm.

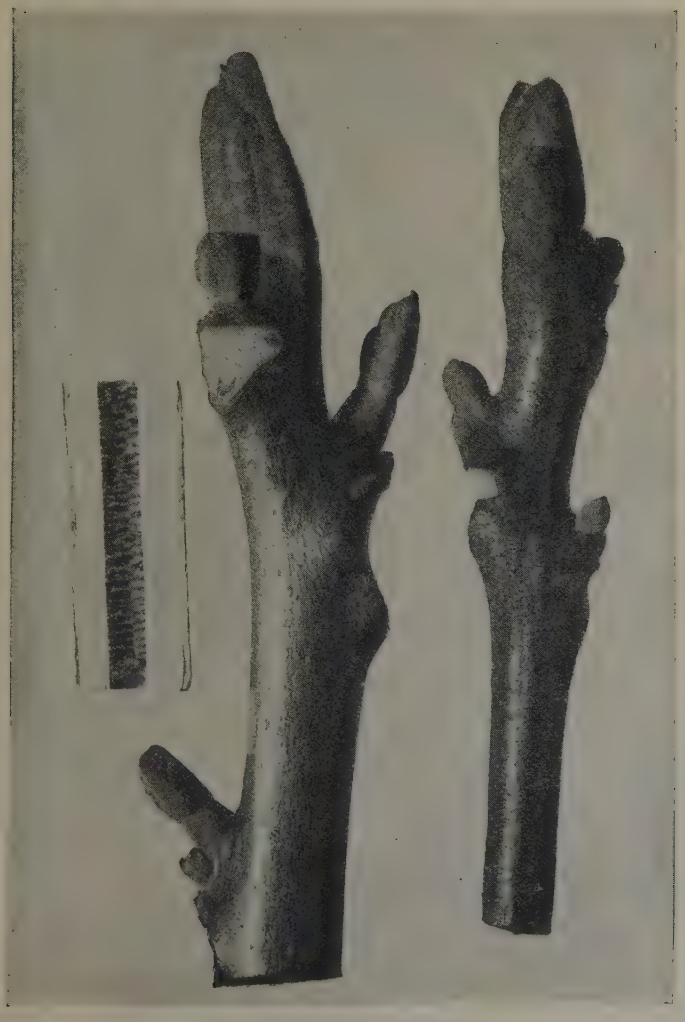
Oak buds, some tiny and others full sized, crowd together without system and in varying numbers at the tips of the twigs. They seem to be striving one against the other for the best positions. We shall find no other buds of the same size just like them in their grouping. The trees of the black oak group we can distinguish from those of the white oak group almost as well by the buds in winter as by the leaves in summer. If we find five-sided oak buds with scales in distinct tiers, each scale directly above the one below with little or no overlap on the sides, the tree very likely is one of the black oaks. With one exception, chestnut oak, buds of the white oak group have scales which overlap irregularly. They are also more rounded at the apex, and are generally smaller than those of the black oaks.

On twigs of the red, black, scarlet, and pin oaks, which belong in the black oak group, we shall often find four or five buds in the terminal cluster. Red oak buds are light brown, pointed, and, under the magnifying glass, distinctly hairy at the apex and along the scale margins. The brown buds of the black oak, each rather broad for its length, taper to a blunt point. Except for the first scales at the base, they are covered closely with white wool and appear gray against the spotted stem. On the scarlet oak twig the buds, comparatively small, are dark reddish-brown, and the upper half of each is covered with fine wool. Sometimes those in the end cluster are partially hidden by the old leaf stem which remains attached to the twig all winter. Pin oak buds are very small, light brown, shiny, and pointed, with only a few hairs along the scale margins.



FIVE BUDS OF THE HICKORIES

Each terminal resembles a small rosebud. Left to right we have Shagbark, Kingnut, Pignut, Mockernut and Bitternut.



BUDS OF THE BUTTERNUT

Each long bud with the folded, leaf-like scale contains leaves; the short rounded ones contain flowers.

We frequently find as many as six buds in terminal clusters on twigs belonging in the white oak group. The white oak buds are short and rounded, about as long as wide, reddish brown, and very slightly hairy. Like them, the swamp white and the post have but few hairs. The former, reddish brown, too, are generally shorter and are bluntly pointed, while the latter, a rusty brown, are like tiny hemispheres. It is possible to know individual bud characteristics for each kind of oak.

Trees of the willow family we may know easily by their buds, but species are difficult to distinguish by any of the common means of identification in any season. As in the elms, there is no terminal. But willow buds, one at a node, grow around the stem in spiral arrangement. They are flat on the inner side and lie very close to the stem. There is a variety of colors among them—red, green, and tints and shades of brown from straw color to darkest brown.

Poplar trees as a rule have buds which are gummy and fragrant, especially if lightly pressed. A terminal bud with five distinct scales and a lateral bud with a hard scale directly above the leaf scar are characteristic of the poplars.

The most common nut trees of New England are hickories. The terminal bud of each of these in shape and manner of growth suggests a tiny rosebud. Every petal-like bud scale has a midrib more distinct in some than in others. The terminal of the shagbark hickory has two very woolly, dark-brown, pointed, outer scales. Next to these are less woolly, yellowish-brown scales, pointed at the top of the midrib. The kingnut terminal also has two kinds of scales

HOW MANY FRIENDS HAVE YOU IN THIS GROUP?

These are all oak buds, reading from left to right: Red, Black, Scarlet, Pin, Bear and Shingle of the Black Oak group; and White, Swamp White, Post, Overcup, Yellow, Chestnut and Bur of the White Oaks.

visible, the outer golden brown, smooth, and hard; the inner, yellowish-brown covered with soft silky down. Pignut and mockernut terminals have no hard scales in winter; the former is golden brown, while the latter is yellowish brown and downy. It is easier to distinguish these by the laterals, for the pignut laterals are golden brown, shiny, and rounded at the apex, and each mockernut lateral, the upper part of which is like the terminal in color, has a hard brown scale at the base which reaches half way up the bud. Bitternut twigs have conspicuous bright yellow buds. The outside scales of the terminal, granular and somewhat hairy under the magnifying glass, make a long flattened point which is often oblique. Above the leaf scar we may find two buds, one prominent and one tiny.

Another nut tree, the butternut, we cannot fail to distinguish by its downy, grayish-brown buds. The bluntly pointed terminal, a leaf bud, is distinctly three-sided. Over its top is folded, like a tiny leaf, an outside long scale. Along the twig above, but not adjoining, the leaf scar, we find more leaf buds of the same shape but on elongated, stalk-like bases. Small rounded laterals, flower buds, come just above the leaf scar, sometimes as many as three in all.

Patient and close observation will show that all buds have their distinguishing characteristics. As a means of identification during the leafless season, buds are important. They have beauty of form and often exquisite coloring. They are always present, although in summer they are nearly hidden in the axil of the leaf, or entirely covered by the base of the leaf stem, and in some cases partly concealed within the twig itself. In the early summer they are very small. Later during the winter they are comparatively large, even though the weather may be very severe. Then there is no perceptible change until the warm days of late winter or early spring release within them the latent energy which lengthens the scales, and, either gradually or more rapidly, depending on the amount of sunshine and moisture, turns them back, exposing to the light the embryo leaves and flowers within. Each minute folded leaf contains a wonderful, green, granular substance called chlorophyll. And through the agency of chlorophyll only may inorganic material taken from the soil by the plant be converted by the plant to organic or carbonaceous material fit to sustain animal life. Upon buds, then, with their precious chlorophyll content, depends our existence. They are our friends.

How do our friends, the feathered architects of field and forest, build their homes? The May issue of NATURE MAGAZINE *will tell you in a fascinating and beautifully illustrated article. In that number, also, will appear the first article from Paul Griswold Howes, who writes of his discoveries at the biological research station in Dominica. Gayle Pickwell tells of the mourning dove, and R. Bruce Horsfall presents this beautiful bird in color. Mr. Shepheard-Walwyn's second article adds to the charm of his first; Samuel Scoville writes of the striped pussy; Tom Gill, Johan Menander and Albert Hansen are among the other contributors.*

Spirit Voices of the Early Dawn

By R. Bruce Horsfall

(ILLUSTRATED BY A FULL-PAGE INSERT IN COLOR BY THE AUTHOR)

We asked Bruce Horsfall to lay his brush aside one day and take up the pen. The result was a charming and human little story, for he knows wild life as well as paints it. He has laid his brush aside several times since and this time his pen has written the epic of the Violet Green Swallow. He says that it doesn't tell all there is to tell, so that will have to be saved for another day.

FAINTLY in the northeastern sky there was promise of dawn. The twittering of birds had called me to witness the coming of a new day, even before the clock in the steeple in the little western Oregon town told me that the hour was three. The sun was still an hour or more below the horizon. It was too dark to see, but I could hear the birds, like spirit voices of the early dawn, swinging back and forth outside my window.

When daylight broke the birds were still there, a happy, playful flock of violet-green swallows. None is lovelier than they with their shimmering violet and green backs and pure white underparts and the long white flank feathers which reach up and over the base of the tail.

A little later in the season I was at Klamath Falls and there found the awakening hour for swallows was two-thirty. Even the night-hawks have to get up early in the morning to beat them. A-wing! a-wing!—from two-thirty in the morning until late in the evening and all one round of pleasure. No scrapping or fighting ever takes place in swallowdom. Was ever known another such life? March in western Oregon is one of the most charming months of the whole year. The air is clean and fresh and the grass a vivid green after the moist, cool winter. Sunlight sparkles through the drifting fleecy clouds which, floating lazily by, now obscure and again reveal a sky of intense blue.

In the southern part of the state the woods are carpeted with beautiful pink dog-tooth violets and other spring blossoms. En masse on the open hillsides, the chaparrals are showing their colors. One sees a whole slope covered with a miniature forest of kunzia bushes dressed in their gray-green finery, and the ceanothus gleams afar with its mass of pinky white bloom. Newly leaved, the poison oak glows red and there is a goodly sprinkle of those wonderfully picturesque madrone trees with their long snaky arms of orange and brown.

Early in March, ever drifting onward, northward, the robins move over the field in countless thousands like autumn leaves before a wintry blast. Those behind fly up and over the birds ahead, to be in turn overtaken, and thus the tide rolls on for days and weeks gathering impetus day by day. Each individual averages about twenty miles a day. No hurry for them. They are not due on the Columbia for another two or three weeks. So it's loiter and eat; gambol and play.

High overhead the vanguard of a fleeting host goes clipping by—the violet-green swallow. They have a date to fill in Portland on the fourth of March. Here it is the first and the Columbia is still four hundred miles away. But, the day is beautiful and what is four hundred miles to them? Why, they are almost there! So they swing around and have another game of cross-tag.

I've watched them winging their erratic way over a still stretch of the Rogue and seen them suddenly zoom aloft and be gone out of sight in the length of time it takes to tell it. In a straight flight they might make their goal in five or six hours, but such is not swallow nature. To be a-wing is to them the joy supreme.

"BROTHER URGED SISTER TO TRY HER WINGS"

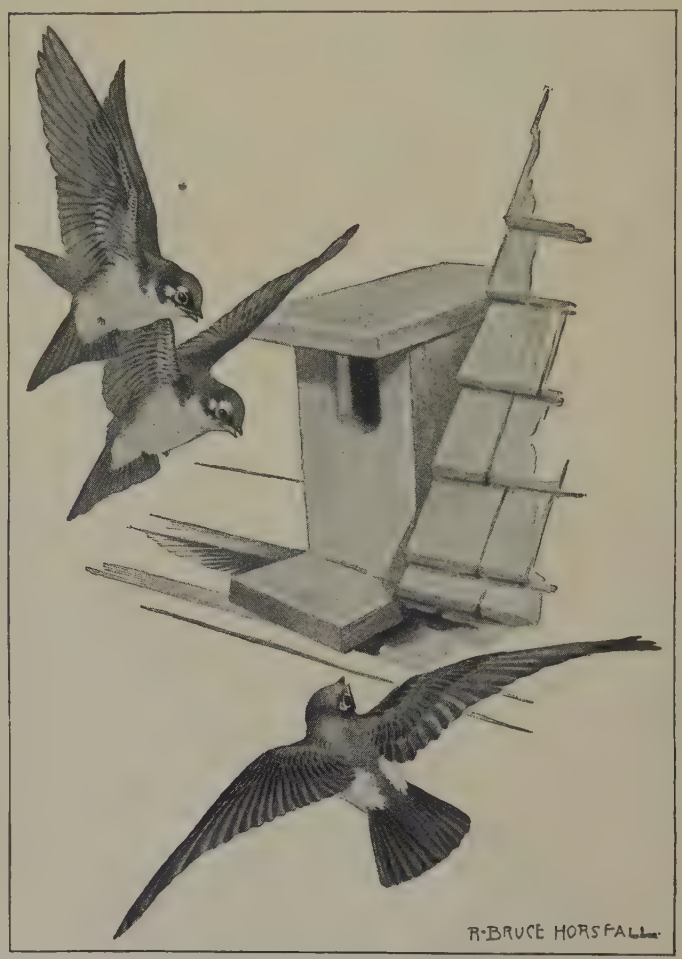
When we first went to live in Oregon, violet-green swallows were about our house in abundance. For three years they appeared to find no suitable places to nest in. I could see no reason for this state of affairs, because, the first thing I had done was to put up some regulation bluebird boxes suitable as I thought for all sorts of box-nesting birds. However, those boxes had one imperfection — they were an expedient. Having no boring instrument, I had simply sawed corners out of the boxes. They served our bluebirds all right, but when swal-

lows went in, they proved to be traps. Their legs were too short for the jump of four inches and the birds could not fly out again. Finally I made a box with the regulation hole in the center and though only four by four by eight inches deep a mother swallow soon found it.

She was a lovely confiding little mother as we soon discovered. A little lighter in color than the other mothers, especially about the neck. Having seen her carrying feathers around to the northern side of the house, we opened the top of the box and saw a neatly lined nest containing one translucent pinkish egg, three-fourths of an inch long. That was on June the twentieth and three days later another egg was added to her precious store.

Now comes the sad part of the story, where misapplied kindness wrought havoc with the little home. Finding the mother wanting feathers for her nest, we broke open an old chicken feather pillow and tossed a few out upon the wind. These she caught and carried straight into the box. She never had a chance at more than one or two out of a handful, because so soon as feathers began to fly, all the violet-greens of the neighborhood joined in the chase, and there were eight pairs.

Finally she learned to take them from our fingers as we leaned out of the window beside the nest box. This was such a treat for us that we kept it up too long and we learned too late and to our sorrow that four of her six eggs were buried so deeply in feathers that they did not hatch. The first birdling was born July the eighth, a wee pink baby almost hidden in fuzzy down. Three days later a second baby joined it in the cozy nest.



"OTHER SWALLOWS CAME TO VISIT"

They grew wonderfully, adding two inches to their total length in six days' time. Each baby opened its eyes for the first glimpse of light on the tenth day, with the second baby just three laps behind the first one in everything. When I took them out to paint their portraits, they were afraid and their fear grew steadily stronger because they could see. With their newly formed pin-feathers they now resembled little porcupines.

From the first week until they opened their eyes we helped the mother feed them by catching house flies and other soft-bodied insects. Our fingers were too clumsy for their small mouths so we used the wet end of a broom-straw to which the wings of the insects would stick and thus reach their destination. However, after their eyes opened, fear was upon them and they would take no more food from our hands.

As soon as the feathers broke from their sheaths we knew them for brother and sister; the difference in color was immediately apparent. Even in voice there was a difference, the brother would say "tee" and sister would chime in with "tweet," but in a much more delicate tone. When we opened the back door to look in they were quiet as mice.

On July 22 when they were two weeks old, eight baby swallows came to visit them, each taking a few peeks into the box. They came every day for several days, some of them even bringing food to the twins as much as to say, "Hurry up and grow, we want you to join our merry throng—the more the merrier. Just see what good times we are having."

On the twenty-sixth a flock of about fifty adults came and took turns looking in at the youngsters and expressed their opinions to the mother as she sat contentedly on the wire nearby. The way she took it they must have all been very good opinions indeed. No swallow mother ever had a handsomer pair.

The father brought no food at any time, nor had he helped with the incubation. Our handling his babies did not fret him the least bit, nevertheless he was a brave, watchful father. It was he who first took the feathers from our hands. Doubtless he had chosen the nest box and encouraged the mother to use it. Besides he was always on guard, leaving only for short periods during the morning and evening, presumably for a dip in the lake a half mile away.

At eight o'clock in the morning of the twenty-second day of his young life, brother jumped out and sat on the door-sill of his home, not quite brave enough to try flying but thinking strongly of it. Little sister sat in the doorway and encouraged him to try. He pattered back and forth for some time, and—my; that was a close call! On one of the turns his long wings brushed against the front of the box and nearly pushed him over the edge. How he scrambled to get on again and for a long time huddled close up under the door, his little heart beating a rapid tattoo.

At twelve noon father swallow came and talked to him encouragingly from the wire about ten feet away. Soon brother launched forth on untried wings and landed almost without a false move by the parent's side. They were untried wings indeed, because baby swallows do not stand and flutter practicing the flying movements, so this first flight was truly a remarkable performance. Proud as Punch, the happy father bobbed and turned his head and twittered joyfully.

A few moments later both skimmed over the field. Two turns about sufficed the baby and he alighted on the roof of the neighbor's house and rested. At four o'clock he was

back at the box endeavoring by short flights to get sister to join him. Failing this, at seven-forty-five the faithful little soul hopped into the box to sleep with his sister for the night and the mother gave them both a generous meal of night moths before they closed their eyes in sleep.

The following morning brother was out again at eight-ten and between ten and twelve noon came back and had several cat naps on our hands. Because of brother's confidence in feeling the freedom of his wings and trust in his ability to fly if need be, for the first time since opening their eyes, both youngsters took insects from their human friends. There was complete faith and trust. Grave fear had left them.

At one-forty-five both birdlings were out of the box on the wire and by four o'clock had gone from our ken. We cleaned the box but left it in place, we knew that when another year rolled around they would return and we wished them to find the old home awaiting them.

"I TOOK HIM OUT TO PAINT HIS PORTRAIT"

It was the fourth of March. The year had rolled around. We had gone to the particular rendezvous of the earliest arrivals. Although it was wet and raw, with a dribbling of large snowflakes the swallows were there. The weather bothered them not at all, and they were sportively catching the flakes as they fell. Perhaps these earliest birds were working up to Alaska where snow was common to them. At any rate they were not worried. They knew all about the tiny water flies that hatch out in myriads in the melting snow waters of spring.

This unseasonal snow was a lark to these swallows. Feathers, millions of them! lining for nests! They chased and caught dozens of the fluffy things only to find that they had been chasing phantoms. But it was great fun while it lasted and well worth traveling two thousand miles to enjoy.

We were looking for our little mother among them but she wasn't there. Not until the seventh of April did we see her and her trusty mate around the old home site. However, that year we waited in vain for a home on the window-sill. Instead they had discovered a perfectly glorious place in the drain pipe which led from the house out under the sidewalk to the street, and began on the nineteenth of May to carry straws. About two feet in they built a nest. All would have gone well in any ordinary season, but on the twenty-fifth a heavy thunder storm came up and washed home, eggs and all into the street.

We were enjoying a trip to the top of Larch Mountain at the time and watched the gathering of the storm. From an insignificant collection of fleeting mists it grew into a tremendous black billowy form which, after swinging about against the glowing white of Mt. Hood retraced its path and broke over Portland with the downpour of a cloudburst—a deluge of water lit up by darting streaks of lightning from which the sound came rolling up the mountain to us like the burst of a thousand "Big Berthas."

It was a grand battle of the elements. But grand as it all was, it was fatal to the hopes of our dear mother swallow. However, I had learned a much needed lesson and was no longer in doubt as to the kind of box suitable for swallows. When we came home a week later I put up a box in a horizontal position, four inches square by eighteen inches deep with the entrance at one end, and inside of an hour our mother swallow was building a new home in it.

Two other boxes like it on the north and south side of the house were taken that same afternoon by other pairs of swallows. I had one box just under the roof of the porch not more than four feet from my studio window in which the violet-greens tried to nest, but in spite of my watchful care English sparrows broke it up by filling it full of all kinds of chaff, rubbish and feathers. Then, one day I discovered that even the sparrows had deserted the box. What could have happened. I looked to see. A tap brought a queer buzzing sound. Ensconced in the very middle of a warm feather bed was a mother bumblebee guarding her first born. I let her stay—any creature that could help me outwit the English sparrow was a friend indeed and I watched her going forth and coming in with a deal of interest.

August 1 found the violet-greens in company with tree swallows in large flocks migrating southward. On the first of October the last large flock went through and it occurred to me that these might be the very swallows of the March snowstorm with their children, returning from the Far North. The first swallows to come and the last to go. For the following months the spirit of the early dawn would be voiceless. But, happily, the seasons roll by to another year.

PHOTOGRAPH, J. G. ALLEN

A PRETTY legend brought to America by the Dutch colonists explains how Bunny came to be associated with the festivities of Easter. Many years ago, in the land of dikes and windmills, there came an Easter when the people were perplexed to think of some way to keep the children from disappointment. The harvests had failed, and material for the usual treats were lacking; but, at last an ingenious mother solved the problem. Eggs were painted with bright colors and hidden here and there among the grasses and flowers in a grove of trees, to be found by the eager children. Just as a keen-eyed youngster spied a nest of the gay-tinted eggs, a hare leaped from its hiding-place nearby and ran swiftly away. "Look!" said the happy child as she clapped her hands, "See the beautiful eggs that the hare has laid for us." And ever since that time "Herr Oster Haas" has helped in many lands with the Easter joy and become a necessary character

PHOTOGRAPH, J. G. ALLEN

DEEPLY implanted in our natures is the love for the young. Few can resist the appeal of fluffy chick or duckling, and in some way these downy younglings have come to be identified with the observance of Easter. It has become a common practice to exhibit them alive in stores, to be purchased singly or in couples, and taken home to the children. While on exhibition in a comfortable room, perhaps under the protection of a mother hen, the little creatures seem contented enough, but a cruel fate usually awaits them in their new home. Children love them in their own fashion, but cannot care for them as did their natural mother, and after a day or two of misdirected affection, they usually die a miserable death. Parents who have a real love for the young birds, or a proper appreciation of their duty to their own children, will not foster such cruelty, especially at a season dedicated to the memory of Him who ever taught kindness and charity

MAKING A CAREFUL TOILET

The varying hare is particular about washing, moistening its paws and slicking up its face.

THE LIFE OF THE VARYING HARE

TO FLY OR NOT TO FLY

That is the question that is troubling this little hare when the camera shot him.

By A. Brooker Klugh

WHAT IS the difference between a hare and a rabbit? These two terms have been used for many, many years to distinguish between two well-known European species, but they are more generally misused by the casual individual than otherwise. Rabbits live in burrows, and their babies are born blind and naked. Hares do not dig burrows but live in "forms," and their babies come into the world with hair and their eyes open.

But what has this got to do with the varying hare? you may ask. The varying hare, *Lepus americanus,* is a hare, one of the commonest and most characteristic of the mammals in the northern softwood forests of America. It is usually called, however, snowshoe rabbit or white rabbit. Hare though it is, "rabbit" it has been, and "rabbit" it will probably continue to be throughout its extensive range.

As with most wide-ranging mammals, this species varies in coloration and size with different localities. The largest and most richly colored form is *Lepus americanus virginianus,* found in elevated regions as far south as Virginia. Color is the cause of the name of the varying hare, because in the autumn it changes its brown coat to one of white and in the spring dons a brown color again.

It was once thought that the change in color was a change in the color of each individual hair, but we now know that it is really due to a semiannual moult. The coat of this fellow consists of three sets of hairs, particularly marked on the top of the back. There is a fine, short, dense underfur, overlaid and concealed by a longer and coarser set of hairs, all topped by a longer, coarser and more sparsely distributed set of hair, the tips of which overlie the middle coat. The underfur is buffy-gray with a darker tip. In summer the hairs of the middle coat have dusky tips and a broad buffy zone near the tip, and the hairs of the outer coat are glossy black on the end. It is this mixture of black and lighter hairs which gives the animals their "pepper and salt" appearance in their summer coats. Fully mature animals are darker on the back because of the greater development of long, black hairs.

When the autumn moult takes place the new hairs of the underfur are still bicolored, but the colors are paler than in the summer coat, while the new hairs of the middle and outer coat are pure white. The moult, both in fall and spring, usually begins about the head and on the feet and proceeds, more or less irregularly, over the body. The time of the moult not only differs with the locality, being earlier in fall and later in spring in the far north, but is influenced by the character of the season, the fall moult being later in mild winters. There is a considerable difference among the different geographical races of this species in regard to the thickness of the overlying winter coat, especially on the back. The extreme northern forms have a thick, heavy layer of white hairs which completely conceals the buffy underfur. In the more southern races the overlying coat of white hairs is so thin that the buff of the underfur shows through and slightly tinges the white of the upper parts.

THE HARE BASKS IN THE RAYS OF THE SETTING SUN

Usually called the snowshoe rabbit or the white rabbit, the varying hare is really not a rabbit, but the name has so long been misapplied that it is impossible to change it.

The name of snowshoe rabbit comes from the size of the hare's hind feet, which are four inches long with a spread of three inches. It is with these snowshoes that it is able to skim with ease over the softest snow, escaping its enemies and searching

for food. The hind legs are very powerful. Even a half-grown varying hare can give one a kick which, as I know from personal experience, is something to remember. These legs are good for immense bounds of from eight to ten feet, which the hare makes when traveling at full speed, carrying it along at the rate of twenty-six miles an hour. The hind feet are also handy for signalling by thumping on the ground. When a hare comes across something which arouses its suspicion it stops and thumps, and this signal puts its neighbors on the *qui vive*. Twice when I have pitched my tent in the haunts of this species I have noticed that for the first two nights a varying hare thumped at sight of this unusual object, but after this the tent was evidently accepted as part of the landscape, and there were no more signals. The varying hare is not a strong swimmer, and hops, rather than swims, in the water. It will sometimes take to the water if hotly pursued, and now and then apparently of its own free will. The hare is well equipped to travel fast and far, but the home range of each individual is very small. In the spruce woods of New Brunswick, where I made a special study of this species, I became familiar with the appearance of a good many individuals. I found that each individual came out to feed in the evening and in the early morning within a space of less than fifty yards. One particularly well-marked hare was always to be found within an area about thirty yards square. From this, and from other data, I am inclined to think that at most a few acres represent the home range of a single hare.

AH-HA! WHAT'S THAT I HEAR?

Startled by the sound of an alien approach the varying hare will sit up and listen, ears erect and body ready to scamper away.

During the daytime the varying hare remains in hiding in its "form," perhaps under the low-hanging branches of an evergreen, or under the overarching leaves of tall plants. In some cases an individual hare has but one "form," to which it returns each morning, because I have put up the same hare from the same "form" several times on different days.

During the summer the varying hare lives on a great variety of herbaceous plants. Where available, clover leaves and clover heads are its first choice, with tender blades of grass a close second. But even when such food is abundant it varies its diet with the leaves of various shrubs and trees, and even in summer sometimes eats the newly developed needles of the spruce. When feeding on the leaves of bushes and trees it stands up on its hind legs, cuts off the twigs, and eats the leaves from the fallen twigs. One of the most remarkable sights I have ever seen was a varying hare standing on its hind legs on top of a stump to reach some elder twigs. It jumped off the stump to eat the leaves of the twigs it had cut down and hopped up again to reach for more.

In winter this hare feeds on dead grass, buds, the bark of trees and shrubs, and the foliage of conifers. As far as is known, he never drinks, finding enough moisture in his daily fare.

The young of the varying hare are usually from three to four in number, and are born in a nest made by the mother under some brush or in a tangle of tall herbage. This nest is made of grass and leaves and is lined with fur, which the mother plucks from her own breast. The hair is also used as a blanket with which the mother covers the babies when she leaves them.

The young are born in May or early June and remain in the nest from two to three weeks. In New Brunswick the youngsters are to be seen foraging for themselves by the end of June, and at this time are about one-quarter the size of an adult. It is usually assumed that the young are full grown by the end of autumn, but in New Brunswick there are certainly varying hares of two sizes in spring and early summer. From this fact I am inclined to think that they do not attain their full size until the end of their second year. They are believed to live for eight or nine years, but, as is the case with most wild animals, we have very little data as to longevity.

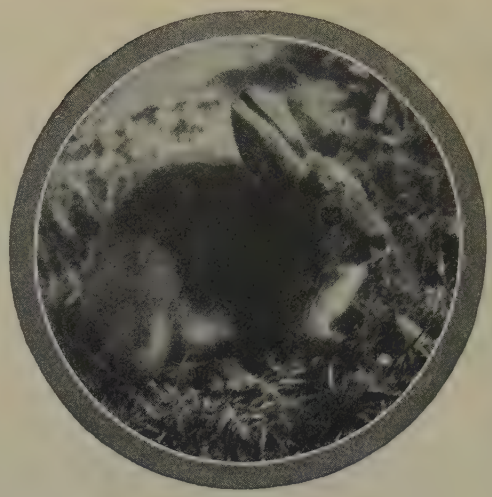
The varying hare has a host of enemies. It is the chief prey of the larger flesh-eaters, especially the fox, wolf and lynx, and the larger owls. The bloodthirsty weasel is an inveterate foe, and by its persistence makes up for its lack of speed. A hare when pursued by a weasel puts on a burst of speed, but soon crouches down and waits, going off again at full speed as the pursuer approaches. Though I have never seen the end of the hunt, there is not much doubt but that in most cases it ends unhappily for the hare.

Most, if not all, wild animals have their cycles of abundance and scarcity, due to various factors, but in no animal are these cycles as conspicuous as in the case of the varying hare. Some years are "rabbit years" in a certain locality, years when this species is tremendously abundant. These are followed by years when it is so scarce that it seems almost to have disappeared. The reason for these sudden decreases is disease which breaks out among the dense populiaton and carries them off by hundreds of thousands. As far as investigations have been made it does not seem to be any one disease which thus decimates them, but a combination of bacterial infection and internal parasites.

The varying hare pays considerable attention to its toilet, licking such parts of its coat as it can reach and washing its face and head by licking its paws and rubbing them over its face, head and ears. In spite of all its efforts at cleanliness,

it is not able to keep itself free from the large bluish wood-ticks, *Ixodes,* of which from two to thirty are to be seen on the head, and especially on the ears, of most hares in many localities. It is no wonder that the hare is not able to get rid of them, for these parasites drive their sucking mouth-parts into the skin and hold on so stubbornly that it takes a pair of forceps and a good deal of manual strength to remove them.

In the early evening, and again in the early morning, the varying hare likes to seek an open place and bask in the slanting rays of the sun, sometimes squatting and sometimes stretching out at full length. When an individual of this species is among tall herbage and it catches a sound which arouses its curiosity or suspicion, it stands up on its hind legs to get a clearer view of its surroundings. I have seen them thus sitting partly erect for some considerable time.



HALF-GROWN YOUNGSTER

The varying hare is one of the commonest mammals of America's northern softwood forests.

While it cannot be regarded as a social animal in the strict sense of the term, the varying hare is at times decidedly sociable. Two, three or four of them will sometimes engage in what seems to be a game of tag, chasing one another in turn at top speed and jumping over one another. Sometimes the jumper will administer a kick to the one it leaps over. I have seen them thus plying for half an hour or so in an open spot on summer evenings.

This hare has paths in the woods which it follows summer and winter. These paths are often quite well worn in summer, and in winter they are frequently packed down to some distance below the level of the surrounding snow.

The varying hare is usually regarded as a silent animal, except for the piercing screams it utters in intense pain or great fear. My close study of this species in the New Brunswick woods brought out the fact that it has a very low whispering call, a note so low that the human ear cannot detect it at a greater distance than about eight feet, though from their actions I judge that the hares can hear it considerably farther. This note is not a difficult one to imitate by gentle drawing in the breath with the partially opened lips almost blocked by the tongue, and by thus imitating the note I have several times called individuals of this species to within a couple of feet of me as I sat motionless on the ground. They are also easily decoyed by a low-pitched squeak made by the lips on the back of one's hand.

Marco Polos of the Wind

By Ben Hur Lampman

FROM THE south comes a call to the birds, unheard by mortal ears yet insistent as a trumpet, ringing away and away to the north where the snow geese feed by shores uncharted. The avian migration is begun, that giant sky trek which amazes us and baffles our comprehension, since as surely as a freed arrow this small traveler or that will find unerring a winter home in the Argentine or a nook by the tropic canal. But there are other migrants abroad, stirred by a kindred impulse of unrest and fully as brave to meet it. They have no wings, yet they fly, the wind as their motor and the substance of their own frail bodies to bear them.

If you look across the grass at morning, the gray-brown grass of the spent summer, ten thousand silver cords will catch the sunrise and toss it back to dazzle you—in changing pearl and opal and ruddy fire. And the cords are so finely drawn, so slender and almost impalpable that they mock the eye and vanish and reappear and twinkle and are extinguished. Hosts of skilled hobgoblins spun them, ugly little artisan no larger than the head of a pin or of greater girth than a millet seed—the infant spiders that but yesterday emerged from the egg—not to catch gnats, not to make any endeavor for food, but to test the infallible instinct of their kind, who have always been weaver folk. The grass alone? No, they fill the very air, drifting, whirling, dancing away.

Cords of silk, of sheerest silk—for the stuff is silk, and of the finest—so light that thistledown is leaden by contrast, each straightened by the autumn breeze and bound away for adventure; and at the end of each, swaying happily and without fear, the cook and crew and captain of that singular craft—a lonely, valiant baby spider. Unlike the birds the spider migrants have no thought to seek the south. Their cruise is whither the wind listeth, and midway of the great river you would find them, or caught in some gusty vortex of the hills, serenely confident that in the good time of Providence each captain will make port and find a hostel for the winter and so await the sunny end of March.

A long and undulant cord of pliant nacre has touched the bough of the vine maple. He hoists himself like a true sailor, and the hind legs coil that which the spinnerets uncoiled, up and up, until our juvenile hobgoblin has caught the roughness of the bark and is no longer seen. We speak of flying from coast to coast, or from border to border, but there, if you please, is moored a mariner of the air who came from the hill that is blue and vague in the distance—full thirty thousand miles away, so to speak. Moored and snug and competent, no larger, verily, than a millet seed.

A CLASSROOM UNDER THE TREES

The director wondered for a long time what became of the back of the piano box used for a blackboard.

KEN GOES TO CAMP

By JOHN B. CUNO

"SAY, KEN, look what just came!" exclaimed the smiling son of a Long Island merchant to his high school chum as they sat in his den going over their lessons, "the new pamphlet describing the forestry work to be given at Camp Wauwepex this summer! Wonder if it's going to be as good as last summer? You know, I wouldn't swap my experience up there for a bushel of hickory nuts. No, sir!"

"What's so wonderful about it?" queried Ken as he examined the descriptive folder, forgetting about the lessons. "Only thing I ever heard about it was that they worked you to death up there."

"Work you to death nothing," retorted Walt. "I don't say we loafed, but we didn't die of overexertion. I'll tell you one thing; when summer was over I felt as if I'd accomplished something. We had some real jobs to do. You know they won't let kids register for that work. Got to be over fourteen to get in the forestry division. A bunch go to the main camp, but they only take on eighteen every two weeks for forestry."

"That so?" said Ken without enthusiasm.

"Yes, sir; the last thing Southy said as we broke camp was, 'Come up next summer and I'll make you assistant division leader.'"

"What does that amount to?" inquired Ken.

"Amount to!" snapped Walt. "It amounts to handling practically all the details of the division! If that's not as big a job as being a lifeguard at Long Beach, I'd like to know why. I just wish you'd heard what Southy said."

"Southy" was the forester in charge of the forestry instruction. He had said that there were at least 450,000 boys in summer camps and a large part of them could easily be taught some of the elements of forestry. He had added that boys in private camps, scout camps, camps run by churches, the Y. M. C. A., business men's clubs, and all other organizations should be given this chance.

USING THE HYPSOMETER

Taking a sighting to measure the tree is as much as doping out the sun on the sea captain's sextant.

"Why, Southy's description of Pennsylvania's bare hillsides, and her scarcity of wood for the mines, was enough to scare you," continued Walt. "Said timber was being cut in this country four times as fast as it is being grown—see where that will lead to; and then you talk about spending your summer at a seaside resort!"

Ken shrank in his chair, and Walt, brightening the picture a little, continued, "I just wish you could see the nursery we started last summer. Not very big for the first year, but a good start just the same. I am going to camp early this year, before the season starts, to help Southy get that nursery going. We just put in one seed bed last summer. Had some lumber hidden in the big supply tent, which came in handy for the sides of the bed, and used some locust for corner posts. You ought to see the spot we chose for the nursery. It's not far from the camp,

and it's in a warm cove, where the soil is about as rich as any to be found.. Southy said we'd have to get some white pine, Norway spruce, and perhaps yellow poplar seed. I think he has written the state forester already. Isn't it furnished at cost?"

"Furnished at cost?" grumbled Ken, "what do I know about the cost of seed?"

"Well, never mind about the cost of seed," laughed Walt, "you come and help us raise some young trees this year.

CRUISING THE STANDING TIMBER

"Pitch pine fourteen," they proudly called to the tally man who took down the story of the trees.

We'll put in half a dozen or more seed beds. Bet there'll be hundreds of people trying to buy our stock. Wonder if we should let them have it? I guess we can let some go for roadsides and for filling up bare spots in woodlands. Here's your chance to earn some money while trying to raise trees, if you've got to have money."

"I have to laugh," chuckled Walt, "whenever I think of the incident about the blackboard when Southy insisted on having outdoor school beneath the trees. Said he wouldn't stand for holding classes indoors when there were trees that overlooked the lake, to sit under. But that isn't the funny part. Funny part was when Southy needed the blackboard. Wasn't one in camp, so when the director was away he sent two of us down quietly for a section of the case the piano came in, and to the back of it he tacked a piece of tar paper to write on. The director came back and missed the section from the piano case, and swore he would fire everyone out of camp if the thing wasn't returned. Southy was stubborn —wouldn't give in. And the chief never found it. Couldn't recognize it for the tar paper, nailed to the trunk of a tree, and it stared him in the face every time he came our way to see what the foresters were doing. No one ever told the chief, but there was always a chuckle when the piano case was mentioned."

"I don't like blackboard talks," said Ken.

"You wouldn't mind these," replied Walt. "Southy gives them first thing in the morning. Hardly ever have time to get your tent in order before he starts, but at that you can quiet down a little and let breakfast settle. We were bright and fresh then, and there wasn't nearly so much squirming as at other times of the day. I don't know how in the world we could ever have understood the geography of that territory without a place to make drawings, how we could have worked any problems of scaling logs or tallying lumber, or learned the parts of a tree without chalk and a board. Of course, just as Southy said, classroom work was only a small part of the forestry program, but it started the day. Gave us an opportunity to lay our plans, too. What you would like if you'd only come up is the demonstrations in the woods with axe and saw and compass, calipers, log scale stick, tally book, plane table and transit. I still have those pamphlets used in the course, and the book in which I kept my notes. Let me see, here it is on the shelf. Look here! July 11," half muttered Walt to himself, as he hastily thumbed the pages, searching for the record of an interesting day, "the third day of the course"—

"8:15 A. M.—Principal parts of a tree—roots, trunk and crown. (1) *Roots*—these give the tree its hold in the soil. Two types; tap roots like those in yellow pines, and shallow roots like those in maples and oaks. The tree with tap roots is less subject to wind throw. Roots serve to secure water and minerals in solution from the soil. (2) *Trunk*—backbone of the tree—holds up the crown and serves to transport water and minerals from the roots to the crown, and food from the leaves to the roots. (3) *Crown*—made up of branches, twigs and leaves. Leaves most essential—absorb energy from rays of sun and breathe in carbon dioxide from the air. . . . Got sort of deep there, didn't I?"

"Let me see that notebook," said Ken. "Is this the one your father said was on exhibition when all those visitors from Port Jefferson dropped in? How in the world did you ever keep it looking like this? Oliver Conklin's is all blurred and messed up, cover's torn and the whole thing dilapidated. Well, go on; what did you do after that?"

"9:15—Fifteen minutes interval. Put away notebooks, flopped on the cots and straightened up the tent a little. 9:30—The axe—various types and how to grind and use them. *Pole axe,* the kind Abe Lincoln used. Straight handle, single bitted. Varies in weight from three to four and one-half pounds. Special steel for the cutting edge and sides, to make the chips fly. If made like a plain wedge the axe would stick in wood and could not be withdrawn. *Grinding*

TRIMMING OUT THE WOODS

Old and crowding trees were cut from Jasper Guy's woodlot and it was made a stand worth while.

—turn stone toward you. Keep water trickling. Edge should not be too abrupt. Bring to a finish with pocket whetstone. *Other types—double bitted:* one bit for notching and other edge for bumping knots; *broad axe,* for hewing trees and timbers. Heavy as six or seven pounds. Flat on one side and handle bent so hewing is possible. *Hand axes*—from three-fourths to one and one-half pounds. *Freighters axe*—long-handled type for general utility, particularly on

early western treks of pioneers. *Instructions*—never hack at or chop down or use for target any living tree when dead trees are available. Use axe only on live trees for making thinnings or pruning off branches."

"You know Burdick, don't you? Well you ought to have seen how he looked carrying a pole axe on his shoulder for the first time! Would have cut his head off the way he carried it, if he had tripped."

"10:30—Measuring heights of trees. Three methods: (1) Measure length of shadow of tree, measure length of shadow of pole, measure length of pole and solve for X the height of tree. (2) Take a pole and set it up on a level, 11 pole-lengths from the base of tree. Let one fellow hold pole and with eye to ground at 12 pole-lengths sight on top of tree. Where line of vision crosses pole make a mark. Distance of mark from ground in inches is height of tree in feet. (3) Use hypsometer—measure with a tape a certain distance from base of tree. Sight on top and take readings by use of mirror. Repeat on base of tree. Add or substract according to whether your eye is above base of tree and the answer is in feet. 11:15—Morning swim."

"Well, that's all until after lunch and rest period. Shall I read on?"

"2:30 P. M.—Collecting hike around the lake. Collected leaves of twelve species of trees. Identified the trees by color or feel of bark, by odor or taste of twigs and by appearance of leaves. Oaks divided into two big groups (I must have written these notes up after the trip). Over 250 species of oaks in the world. White oaks have no spines on tips of leaves, black oaks have spines. White oaks have acorns every year, black oaks every other year. 4 P. M.—Back at camp. Southy showed how to dry and mount leaves between newspapers. Said sheets of blotting paper more satisfactory, but newspapers and cardboard cartons O. K. in camp. Mounted my ten specimens, stuck them under the cot for examination later. 4:15—Afternoon swim."

HOW MUCH IN THIS LOG

There's a trick to it and a whole lot of satisfaction in mastering it, to boot, as the boys would testify.

"Not such a bad day, was it?" inquired Walt. "I wouldn't have liked it if they had kept us out of all the regular activities of the main camp. We were lucky, of course, to have a spot away from the crowd, where we could build our own dock, have our own boat and go swimming by ourselves. Big idea of it was, Southy said, to give the foresters a place to themselves in as wild a part of the camp as possible. 'Put them on their own resources,' that's how he expressed it.

"Why, even my ideas about a forest have changed!" he went on with enthusiasm. "It has taken on a new meaning. It used to be nothing more to me than a jumble of trees, but now it means a community, each member with a purpose in life, with a throbbing vitality and an ability to rear its head up amongst the clouds in some inexplicable way—feel as if I'm quoting Southy—to become king of plant life, master of all. I didn't realize before camp that a beech tree could endure shade, or that a pitch pine could live in the sand, that

NO WASTE IN THIS SAWING

Cutting the tree as close to the ground as possible so that no wasted stump is left. Even the chips are saved.

black walnut did best in rich soil and that sycamore and river birch must live in the lowlands near the water. I never thought you could produce crops of trees just like a crop of potatoes. Why, that was just as clear as crystal when we saw what Mr. Prosser was doing with his white pines."

Ken leaned back in his chair, reflecting on the remarks of his chum. He did not realize that a summer could mean so much to his buddy. And he had spent his summer idling on the sands beneath a broad beach umbrella.

Mr. George Prosser was the owner of some seventy-five acres of white pine, some of which was virgin, the last stand of old white pine in that section of Long Island. Mixed with his white pine and surrounding it were younger oaks and pitch pines and hickories. Mr. Prosser was removing the oaks, pitch pines and hickories, so as to favor the white pines and let them grow faster, and the material removed he was selling for cross-ties and smelter poles. The smelter poles were inserted into molten metal to purify it. The price he received for all his logs brought in a regular income. Young white pines were coming up beneath the old ones, while others were spreading themselves all over the surrounding country to the lee of his old stand. He had carefully pruned the lower branches of the big trees so their trunks looked like long clean match sticks standing on end.

"Every one of the groups that took the forestry work at camp visited Mr. Prosser's stand," continued Walt, after having explained the story to Ken. "Our group spent the whole of one day browsing around in it, resting on the thick bed of brown needles and looking up at those great big fellows. We surely enjoyed it."

The day devoted by each of the groups to Mr. Prosser's stand was by no means the red letter day of the course. There were other days of equal interest, and days perhaps when more actual work on the part of each member of the group was necessary. For example, the day devoted to the demonstration area not far from camp, in the woods of a

farmer, Jasper Guy. Each of the four groups taking the forestry course spent a whole day making a thinning and cleaning, which by the end of the summer had grown in size to approximately two acres. The boys with their own axes removed the dead chestnut and undesirable maples, and left standing the white oaks and hickory, whose lower branches they pruned and broke off in order to make better timber. They chopped all the wood into four-foot lengths and corded it along the road. Mr. Guy sold part of the supply and used the remainder in his fireplace. A tract does not have to be cut clean to show profit.

READING THE STORY OF THE LEAVES

Identification of the seeds and leaves of the forest trees was a "classroom" exercise of absorbing interest.

"I liked that work, thinning Mr. Guy's woods," remarked Walt, reminiscing on the part he had played in establishing the area; "but it was hot work and we got so black in that patch of burned trees! I'd a whole lot rather cruise timber. Yes, sir; that's my meat! I helped cruise the timber below the road around the lake. Got so I could tally breast-height diameters with a Biltmore stick just as well as with calipers. You ought to have seen us figure the quantity of timber there was on that cruise! I helped total the diameters of white and black oaks myself. Others did the rest. Boys in later groups finished the calculating. I'm going to help finish cruising the whole stand up there this summer, now that we've got a start on the timber below the road. How'd you like to come and help? The chief said it would be valuable to know just how much of each kind they own."

"Oh, I'm not so keen about it," said Ken.

"Well, if you don't like cruising, maybe you'll like building fire trails and fighting fires," returned Walt. "Of course it was warm up on those hills clearing the brush. Had to run our trails along the ridges and down the ravines, and had to clear every leaf to get a bare line three feet wide."

"More hard work, I see," said Ken.

"Hard work, yes; but a lot of fun just the same. I was there when they first started the trails. A fire got away from the railroad. We just about saved the mess hall and museum. Wind was coming that way, but it wasn't strong enough to get across the line. Besides, we had fighters scattered along the trail to keep the sparks from jumping across.

"Funny to see everyone turn out for fire call, kids and all, about 150 of them. You'd have thought they were a bunch of city fire horses. Got there before the bugle stopped blowing. Had a false alarm one day. Thick smoke from burning corn shocks on the road to Long Pond. I thought it was the Upton. That's only a mile away. Middleton, the ranger on it, says there are over 6,000 acres on that National Forest. Says he is mighty glad to know he can count on 150 boys during the summer season in case his fires are bad. What tickles him is that the forestry bunch know how to fight forest fires. I think Southy ought to get him over this year for some talks around the campfire. Here's your chance, Ken, if you have got to have a job. Get one as a fireguard with headquarters at camp. Then you can be with us most of the time, learning something about forestry."

And so the conversation went on, from forest fires back to seed beds, from there to surveying around Rocky Point, to collection hikes and to rainy days with indoor work beneath the wet canvas, Walt ever urging his comrade to enroll for the forestry work.

"Well, give me a chance to think it over," sighed Ken, yielding at last in a degree to the enthusiasm of his chum.

Day by day his interest grew keener, until he finally asked Walt if he might show his parents the pamphlet that had caused all the discussion. Walt was delighted, and smiled to himself as he watched Ken, pamphlet in hand, hurrying homeward.

That evening after dinner, Ken, thinking he had waited long enough to discover what effect the folder had had on his parents, opened the subject on which he had been spending so much thought. The lifeguard job had somewhat lost its fascination. He wondered whether his family would be agreeable to the change. Much to his surprise, his father without hesitation exclaimed, "Of course I want you to go to Wauwepex! This will be a summer worth while! This is something you will be able to look back upon with pleasure! You will enjoy every minute, even though you do work hard, but when you return you will have done your bit in solving this great national problem, which needs boys as well as men. Not only do they need you now, but in the years to come you will be of inestimable value to your country. Of course I shall fill out an application blank. Send for one immediately! Your mother, too, is very much interested in this plan for you."

Ken, thoroughly converted at last, with a whoop and a hurrah, kicking his heels in the air, dashed out the front door, headed straight for Walt. "Oh, Walt! everything's settled, I'm going with you!" he shouted at the top of his lungs as soon as he reached the front gate.

"I knew you would, all along," laughed Walt, poking his head out of an upper window. "Why do you suppose I went into so many particulars about the program?"

"You win," exclaimed Ken eagerly; "let's talk it over with the principal about getting off a few weeks ahead of time! Think I'll make a good forester? Three cheers for Wauwepex!"

PROVISO TOWNSHIP
HIGH SCHOOL
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MAYWOOD

Ten Interesting Things to See in April

By E. Laurence Palmer

APRIL showers bring many interesting things besides May flowers. In the month of April there are things that appeal to all of our senses; things which we must feel, which we cannot help but hear, which fill the air with fragrance, which make us smack our lips and which we smile to see. It seems strange that people should take a "spring tonic" when everything in Nature serves as a tonic at this time of year. Trees, herbs, fishes, birds, wild mammals, frogs and insects—all seem to "sail into life" with a vengeance, and yet there are people who take a "spring tonic."

Most woody plants at this time of year do their greatest amount of growing or begin their growing period. Some of them have been doing this for a great many years, as is shown by the diaries they have kept. Juniper Jardine in Utah, for example, has been doing this for over three thousand years. Examine a growing woody plant to see if a whole twig increases in length, if growth takes place at the middle, base or tip end only. If you determine this for yourself see how many yearly records you may read on any woody twig you find.

Many of us think possibly that the only plants that bear flowers bear flowers that are showy. If we feel this way it might pay us at this time of year to look at many of our willows, poplars, oaks, ashes, walnuts and some of our maples. Not all of these are uniform in their method of flowering. Some bring out their flowers before their leaves; some, with their leaves; and some, after their leaves have appeared. Try to classify, white ash, sugar maple, silver maple, white oak, cottonwood on this basis, and if this list doesn't suit you, make your own.

Some time in this month you may find the ground beginning to be populated with the seedlings of many of the herbs that will please our eyes later in the year if they do not at present. Conspicuous among these may be the seedlings of the common garden sunflower or, in the woods, of the touch-me-not. If these are not available, any garden will show you a straight or crooked row of radish seedlings. In any of these cases do you find these first seed-leaves to be like the later leaves?

Some herbs made a running start on the season by having fully formed leaves and even buds before they gave in for the winter. These may flower in April. Among them may be the bell-like adder's tongue or many other members of the lily family. For the fun of the thing go into a nearby woods and count the number of different kinds of flowers you find blooming in a square rod. Do the same in some open, unwooded land. Keep your figures, and along in June try the same stunt to see if the same generalization holds. If there is a difference, see if you can account for it. The trees may give you a clue to the secret.

Many fishes lay their eggs at this season of the year. Shad run up the rivers from the sea; suckers run up the brooks from the lakes, and many deep-water lake fishes run into the shallows for the same purpose. From some bridge determine, if possible, the procedure followed by suckers in laying their eggs. Remember that fertile eggs are produced through the cooperation of a male and female fish. In some cases this cooperation consists of partnership to the extent of building a nest through cooperative effort. In some cases the cooperation is forced by brute strength. In some it seems to be but a matter of convenience. April ought to give you the opportunity to get some first-hand information on the situation among some of the fishes of your favorite waterways. If you are interested in this, there is a most interesting paper called "Parental Care Among Fresh-water Fishes," by Theodore Gill, published by the Smithsonian Institution of Washington, which you might like to read.

Frogs and toads may fill the air night and day with their mating calls in April. It should not be difficult for you to find out for yourselves whether these calls are made by the males or by the females or by both. In the common toad, for example, the males have very dark throats, while the females have white throats. The males are also smaller. If common toads are not nearby, you might find that in many other toads and frogs the males have other than white throats, while the females have white throats. Is the frog-toad chorus a "men's glee club" or a "women's choral society," or is it a "mixed chorus"?

House flies begin to appear in increasing numbers during this

month. A few may have made their appearance in March, but by the end of April we are well aware of their presence. Remember a fly dead in April means many flies dead in September. Some members of the group of insects to which house flies belong get their food by piercing material; others have peculiar mouths that suck it from a broader surface. How is it with the house fly?

Red-wing blackbirds make themselves heard in April about the marshy lands where they may be establishing their summer homes. What, if any, peculiar antic accompanies their call? To determine this you will find it best to watch a bird while it is perched conveniently near you? Do other blackbirds do anything of a similar nature?

The little chipping sparrows, which seem so friendly while they are with us, will be establishing their homes in some tree or shrub. They frequently favor evergreens. Chippies are probably the smallest sparrows that you will find. They have, as you may know, brick-red on the top of the head and clear gray breasts. They line their nests peculiarly. What material do they use for this purpose? If later in the season you find a chippy nest with eggs of two considerably different sizes, the larger egg may be that of a cow bird which may be hatched by the chippy. The young cowbird may crowd out the worthy little chippies, so you may let your judgment govern your acts, since cow birds are not protected by law and chipping sparrows are.

Chipmunks, ground squirrels and other small rodents that have been hibernating underground through the winter may begin their summer activities in April. Keep a record of the first day on which you see one of these creatures near your hiking range, and then another year see if they don't come out at approximately the same date. Are they as regular as the birds in this or not? You may get somewhat of a surprise in this if you are so situated that you may keep a reasonably accurate record of first appearances, and may well wonder what teaches them to wake up at the right time.

Gentleman Jim

ONE Sunday morning Roy Coleman, a farmer living two miles from here, caught a white crow and gave it to another farmer named Olive, writes Dr. T. Atchison Frazer of Marion, Kentucky. Mr. Olive came to town to Sunday School, immediately taking care of the crow's spiritual welfare by bringing him along.

"After the service Mr. Olive and I took Jim to my office," Dr. Frazer continues. "We made a careful examination of him. Jim has some grey around his neck and about his bill, and some feathers in his wings have black tips, but otherwise he is as white as the driven snow. He measured thirty-four inches from the tips of his wings, and sixteen inches from beak to end of tail. He has the characteristic 'caw caw' of the crow, and looks exactly like any other crow except that he is white. After a little investigation, I find there is perhaps one white crow to each ten million black ones, so I considered Jim of importance."

GENTLEMAN JIM

Not being able to be a black sheep in a black family, he became the white crow.

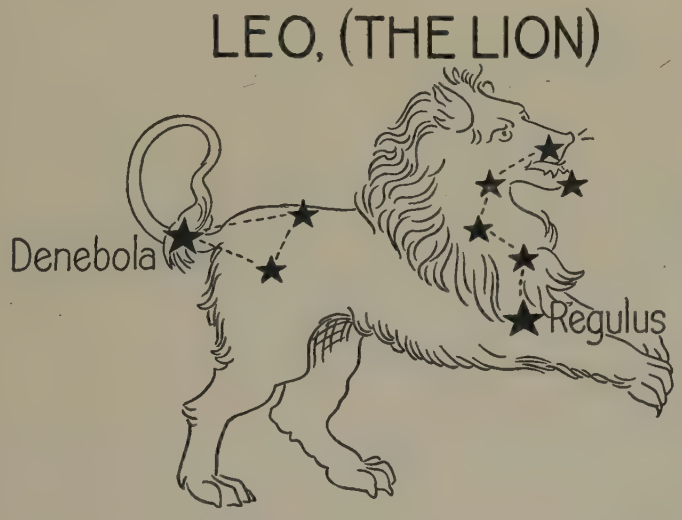
Though really rare, as Dr. Frazer suggests, white or albino crows are rather well known by report, since such oddities are well advertised. There is some evidence that this condition runs in families. A pair of Massachusetts crows, presumably the same birds, had a single white one in their brood of youngsters for several years in succession.

LEO, THE LION, AND THE APRIL SKIES

By Isabel M. Lewis

LEO, THE LION, one of the twelve constellations of the zodiac, represents in the mythology of the Greeks and Romans the Nemean Lion which was slain by the hero Hercules as the first of his celebrated Ten Labors. Christians of the Middle Ages, however, who preferred to picture biblical figures in the constellations in place of those of the old pagan mythology, saw in Leo one of Daniel's Lions.

Among the Egyptians the stars of Leo were greatly honored because the sun passed through this constellation and the neighboring one of Virgo during the rise and overflow of the Nile. As a sign of their veneration for these stars, The Sphinx, it has been said, was sculptured with the body of Leo and the head of Virgo. As the sun passed through Leo during the heat of summer, this constellation was always identified with the sun and was regarded as the emblem of fire and heat. It was one of the strange beliefs of ancient physicians that to take a bath while the sun was in Leo was harmful, while medicine taken at that time was poison! Matching this is absurdity was the belief of the weather-wise that thunder then foretold sedition and death of great men.



Regulus, the brightest star in Leo, is one of the twenty brightest stars in the heavens, though it stands at the bottom of the list. It is only slightly excelled in brightness, however, by Spica in Virgo, and Antares in Scorpio, in summer skies; or by Fomalhaut, in the Southern Fish, Deneb in Cygnus, and Pollux, in Gemini of the fall and winter months. Regulus is also one of our nearer neighbors among the stars, its distance from the earth being only about 55 light-years or 330 trillion miles.

The early English astrologers saw in Regulus, whose name is the diminutive of the Latin Rex, the star of royalty, and it was often known by the name of the Royal Star, as well as Cor Leonis, The Lion's Heart. To all born under its influence it was supposed to bring glory, power and riches.

The tail of Leo is marked by the second magnitude star, Denebola, which is an abbreviation of the Arabic name, Al Dhanab Al Asad, meaning The Tail of the Lion. Like the tail of Ursa Major, The Greater Bear, the tail of Leo was pictured extraordinarily long and was curved high above the lion's back. Denebola marked the tuft of hair at the tip. This star was the opposite of Regulus not only in position in the constellation but also in its reputed influence over the affairs of men. While Regulus brought fame and riches to all born under its influence, Denebola brought misfortune and disgrace. Fortunately, in the present age, we are freed from these superstitions of the past and care little whether we chanced to be born under Regulus, the Royal Star, Denebola, the star of misfortune, or some other star that the astrologers claimed had control over the lives and destinies of men. The characteristic configuration of Leo which serves to identify it readily is the clearly outlined Sickle in the head and breast of the lion. Regulus marks the end of the handle of The Sickle as well as the heart of the lion. We will find it on the meridian due south of the zenith at 9 p. m. on April 8. So close does Regulus lie to the ecliptic, the sun's yearly path through the heavens, that on August 22 the sun passes it at a distance of less than half a degree, the extent of its own diameter.

Star gazers should look in the eastern evening sky this month for the great equilateral triangle, symbol of the coming of spring, whose corners are marked by Denebola, in the lion's tail, the bluish-white, first magnitude star Spica, in Virgo, and the orange-hued Arcturus, in Boötes.

Arcturus will be found by prolonging the tail of the Greater Bear or the handle of the Big Dipper for a distance about equal to the length of the Big Dipper in a southeasterly direction.

To the south of the handle of the Big Dipper is Canes Venatici, The Hunting Dogs. Cor Caroli, which is the brighter and also the more southerly of the two stars that represent the two hounds, forms with Arcturus, Denebola and Spica the celebrated Diamond of Virgo.

In the south and southeast at this time, below the constellations of Cancer, Leo and Virgo, may be traced the long line of stars that outline the form of Hydra, The Watersnake, with its two riders Crater, The Cup, and Corvus, The Crow. The latter consists of a compact little quadrilateral of third magnitude stars and is easily recognized.

One will have to be up before sunrise this month to see all of the brighter planets with the exception of Saturn, which is now in Libra and so rises shortly after the time for which our chart is given and remains visible throughout the remainder of the night.

Venus, the brightest of the planets, reaches its greatest western elongation, or greatest distance west of the sun, on the eighteenth of this month and will be a brilliant object in the southeastern sky rising more than three hours before the sun. At the time of elongation it will show the phase of a half-moon in the telescope.

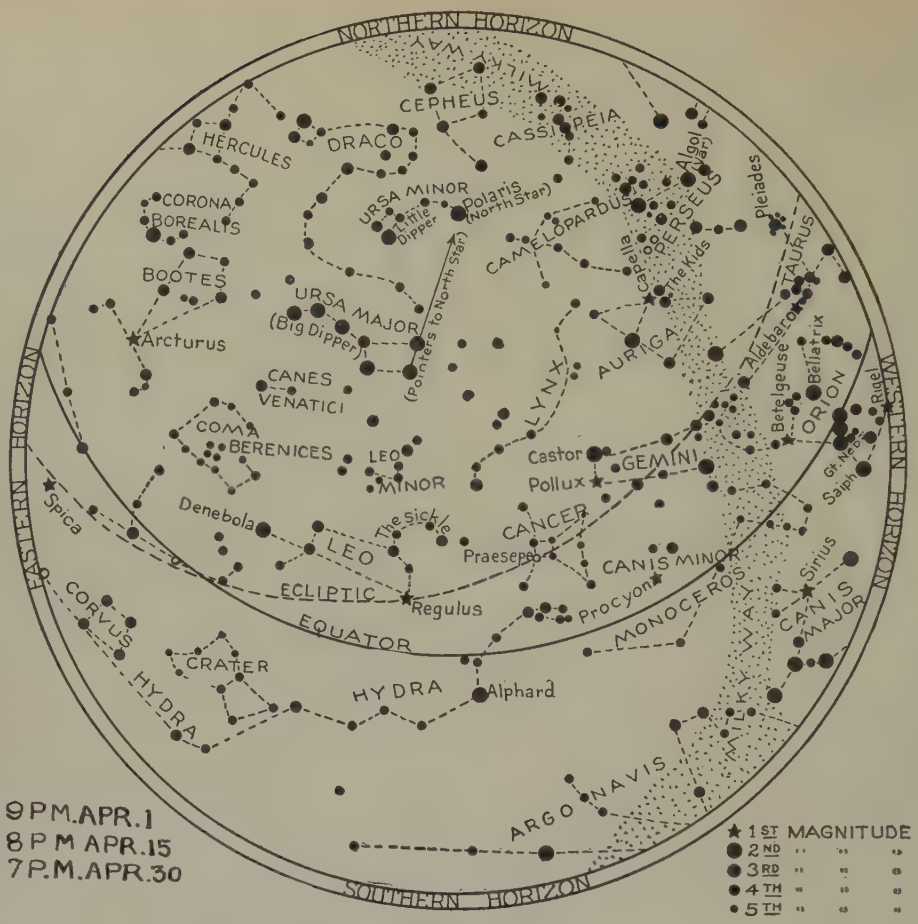
Mercury also reaches its greatest western elongation this month, on the twenty-eighth, and should be picked up in the morning twilight on this date and for a week or so before and after it. It will be found in the constellation of Pisces some distance to the east and a little north of Venus.

Mars passes from Capricornus into Aquarius this month and rises more than two hours before the sun. On the 16th of April its distance from the earth will be about 137,400,000 miles, and it is decreasing at the rate of about 650,000 miles a day. Mars will be in conjunction with the planet

Jupiter on the 23rd of April, passing less than a degree to the south of it. The difference in color of the two planets will then be very marked —Mars a fiery red, Jupiter a golden yellow.

Jupiter is now far superior to Mars in brightness and is slightly brighter than Sirius. It will be found in Capricornus throughout the month and will be a little to the northeast of Mars early in April, but the distance between the two planets will decrease rapidly during the month until Mars overtakes and passes Jupiter on the twenty-third.

A periodic swarm of meteors known as The Lyrids appears every year between April 16 and April 22 with its greatest display occurring on April 21.



To use hold over the head with top toward North

The Lyrids receive their name from the fact that they appear to radiate from the direction of the constellation of Lyra which contains the brilliant Vega. Watch the northeastern sky in the evening hours between these dates for these meteors.

Meteors, you know, are mere dust-like particles of matter speeding through space, generally in clouds or swarms. It is thought that they are remnants of comets that have gone to pieces, and when this meteoric dust becomes trapped by the earth's atmosphere, the friction produced by its passage through the air heats it to incandescence.

Australian Phalanger

TAKING a page from the monkey book, one of the most common marsupials of Australia has turned its tail to use as a fifth hand, and won for itself the name of ring-tailed opossum. As a matter of accuracy, however, this little fellow is not really an opossum but a phalanger, and zoologists are accustomed to give it the name of crescent-toothed phalanger.

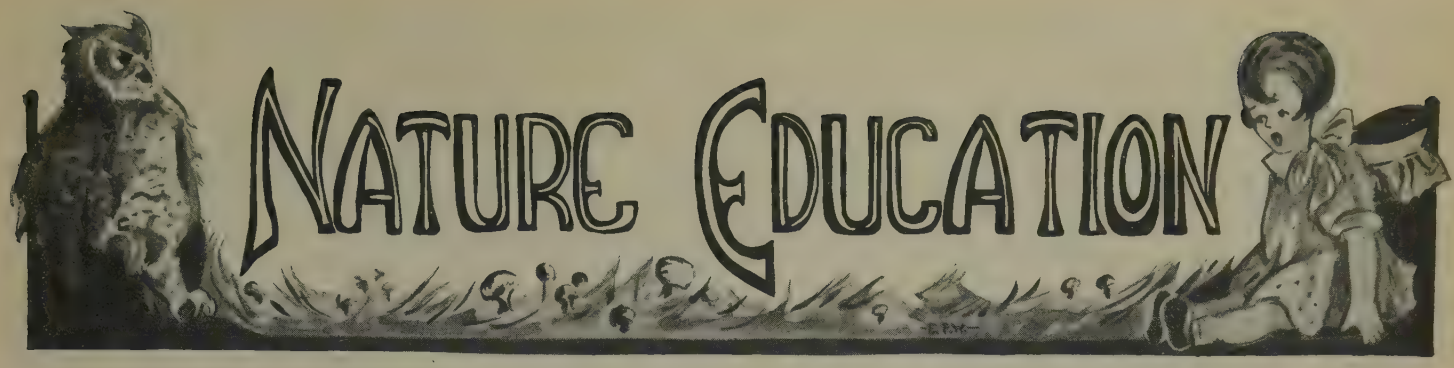
The ring-tail has one outstanding peculiarity. It is a home builder. It fabricates for itself a habitation of interlaced sticks, leaves or grass, or any other available material. It may choose as a home site a place high in a tree or near the ground in a shrub thicket. It constructs its front door on the side of the home, which is a little larger than a football.

PHOTOGRAPH KILROY HARRIS

THE RING-TAILED OPOSSUM

The phalangers of Australia are a large family. They range in size from that of a small mouse to that of a full-grown cat. They are all mainly arboreal in their habits, and prefer the night to the day for their public appearances. The fine texture of the fur of most of the members of the family has resulted in considerable reduction of their numbers.

Rather closely allied to this group are several other kinds of varying sizes, some of which are provided with membranes on their sides, by means of which they can make long leaps like our flying squirrels.



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Dr. Bertha Chapman Cady, Girl Scouts of America.

There are constantly taking place new developments and changes in the Nature Study field, new ideas and new methods. This page is to be devoted to recording these facts in the form of news notes. Kindly send items for this department to Mrs. Elizabeth K. Peeples, 1214 Sixteenth Street N.W., Washington, D. C.

Nature Supervisors Meet A unanimous vote of thanks to Miss Alice Jean Patterson attested hearty appreciation for the profitable program presented at the seventh annual meeting of the National Council Supervisors of Nature Study and Gardening, held February 20, in the assembly hall of the Red Cross Building, Washington, D. C.

J. A. Hollinger, Director of Nature Study, Pittsburgh, Pa., stressed the importance of major ideas with minor ideas subordinated to them in the course of study, and of a major topic for each grade. Training in the ability to think logically he declared to be an outstanding aim in Nature Study as in other subjects; and first-hand contacts with things, or "realism," the preeminently successful means of learning the subject.

Charles W. Finley, Lincoln School, New York City, advocated a progressive outline of the same general topics for all grades. The various phases of Nature Study should be scattered through the course, said Mr. Finley, in accordance with the psychology of childhood, and the teachings of pedagogy and philosophy. Opportunism, the speaker pointed out, is attractive, but may lead to omissions of important subjects, or overemphasis of the relatively unimportant; neither can the teachers' hobbies in Nature Study be relied upon to furnish a well-balanced program.

The value of personal attainment standards in Nature work was discussed by Clarence M. Weed, State Normal School, Lowell, Mass. Mr. Weed distributed copies of certificates given in his classes for specific attainments such as knowing thirty trees by their leaves, knowing thirty trees by their flowers, and the like.

Though emphatic in her opinion that successful Nature teaching depends less upon equipment than upon the teacher, the need of more and better equipment for Nature work was pointed out by Sarah E. Griswold, Director of Primary Instruction, Colorado Springs, Colo., who described in detail a practical outfit for a Nature classroom.

Theodosia Hadley, Western Normal, Kalamazoo, Mich., and J. K. Randall, State Normal School, Fitchburg, Mass., showed from data secured through questionnaires and tests, that in courses offered in normal schools and teachers' colleges about 90 per cent of the time should be given to teaching subject matter and 10 per cent to the teaching of method.

E. Laurence Palmer, Cornell University, Ithaca, N. Y., concurred in this opinion, and outlined the work being done for teachers through the Cornell Rural School Leaflets. Dr. Palmer showed several reels of pictures on Nature subjects made by Wm. L. and Irene Finley.

The following officers were elected for the ensuing year: President, J. A. Hollinger, Pittsburgh, Pa.; vice-president, E. L. Palmer, Ithaca, N. Y.; secretary-treasurer, E. D. Adams, Elyria, Ohio. Executive Committee—A. J. Patterson, Normal, Ill.; C. W. Finley, New York City; E. K. Peeples, Washington, D. C.; J. K. Randall, Fitchburg, Mass.; S. E. Griswold, Colorado Springs, Colo.

* * * *

Proof of Attainment An interesting plan has been worked out by Prof. Clarence M. Weed at the Lowell, Mass., Normal School. It takes the form of a certificate of personal attainment in one or another line of Nature knowledge. For example thirty trees and shrubs are listed to be recognized by the pupil on sight of their leaves. At the bottom of the project sheet is a form to be filled out stating that the pupil has demonstrated ability to know trees by their leaves by the attestation of the teacher. On the reverse are listed suggestions of some things to do with leaves, some things to learn about them and some things that leaves do for you.

* * * *

Outdoor Nature Teaching In spite of large classes and lack of time in the school program there is growing belief in outdoor Nature lessons. The development of a technique of outdoor work is a problem being seriously considered by many teachers. The American Museum of Natural History, New York City, describes an interesting experiment in outdoor education in its pamphlet, "Nature Trails," by Frank E. Lutz.

Notes on Some Woody Plants

By E. Laurence Palmer

If one is just generally interested in woody plants, the information in the charts below will be of interest. If one's interest extends to teaching children about woody plants, one will find much in the charts that will be helpful. For example, the information under the item "range" may assist in giving a geography lesson on the woody plant suggested. The general information should be useful to accompany that which a child can find for itself in case one wishes to use any of these plants as a topic in language. The versatile teacher will find much that is suggestive in the charts and the student much that is interesting.

Common name Scientific name	Sugar Maple Acer saccharum	Apple Pyrus malus	Trembling Aspen Populus tremuloides Mich.	Red Raspberry Rubus strigosus L.	Live Oak Quercus semper virens Aiton.	Eucalyptus Eucalyptus globulus Lab.
Abundance	Very common in range	Commonly cultivated	Fairly common in range	Very abundant	Common in its range	Common, introduced
Habitat	Commonest on rocky highlands and streets	Grown in orchards and yards	Highlands, sandy, gravelly or rocky soils	Hillsides and cut-over lands	Low sandy soil country	Lowlands in the south where introduced
Range	Mainly between Manitoba, Texas, Georgia and Newfoundland though grown as shade tree elsewhere	Introduced from Old World and established as cultivated tree in United States and southern Canada	Newfoundland to Alaska and south to Pennsylvania and California, particularly in mountainous parts	Labrador to British Columbia, and south to New Jersey and Arizona	Near coast from Virginia to Florida, Texas, and Mexico and in western Cuba	Established in southern California and elsewhere in the south; eucalyptus most common from Australia
Shape	Egg-shaped and cylinder-like	Low, wide-spreading tree with gnarled branches	Irregular in form and branching	A low shrub with wand-like thorny shoots	Large, wide-spreading, round-topped, irregularly branching	Erect stately trees of rapid growth; symmetrical
Height	50 to 120 feet	30 to 50 feet	Up to 100 feet	A few feet	100 feet	150 to 300 feet
Old Bark	Grayish; fairly evenly broken when old	Gray-brown with brittle flaky plates	Nearly black and deep fissured to thin, smooth, pale yellow	Reddish, interspersed with thorns	Thick, broken into small, reddish brown to gray scales	Thin, flaking off leaving smooth, gray-green surface
Leaves	Long-stalked, thin, wider than long, somewhat five-pointed, opposite, dull beneath and brighter above	Short-stalked, thick, rough, longer than wide, end pointed, margins uneven, alternate	Long-stalked, somewhat heart-shaped, freely swinging blade, 1 to 2 inches broad and as long, pale green; alternate	Alternate; compound of 3 to 5 leaflets, with sharply and irregularly cut margins; white beneath	Like the blade of a paddle; evergreen; thick and leathery; dark shining green; alternate	Taper-pointed; 6 to 12 inches long, narrow; thickened margins; smooth, blue-green; held edge-wise; aromatic
Roots	Shallow rooted		Shallow rooted	Shallow rooted	Deep rooted	
Twigs	Russet brown, smooth with opposite, pointed, many-scaled buds; leaf scars narrow with three distinct bundle scars	Stout, fuzzy at end; short-stubby fruit-spurs; blunt reddish brown buds; narrow crowded leaf scars	Greenish and loosely hairy when young; smooth, shining red brown when older; buds alternate, pointed, shining, sticky; leaf scars distinct; stipules cars present	Red brown to purple; well supplied with prickles; base of leaf persists below the bud; buds alternate, many scaled, rather conspicuous	Slender, woolly at first, stiff; gray to brown with alternate light brown buds which are very small	Four-sided when young; rather slender and irregular
Wood Nature	Heavy, uniform, hard, strong, close-grained, easily polished	Heavy, hard, tough, reddish brown	Soft, weak, easily decaying, light brown to white	Not considered though hard	Dark brown to black, hard, strong, close-grained, very heavy	Hard, strong, durable, close-grained, pale brown
Wood uses	Furniture, broom handles, handles, flooring, interior finishing and pulley blocks; fuel	Excellent fuel; used in making saw handles and in cabinet work	Paper pulp and to some extent for turning into bowls and cheap wooden utensils	Not used commercially	Fuel only; checks too badly on drying for other uses	Ties, poles, fuel, ship construction work and general construction
Flowers Nature	Small, yellow, in groups near end of twigs on drooping stalks	Showy, white and fragrant, clustered on short spurs	In two to three-inch catkins or tassels; stamens and pistils in separate catkins	White petals with bristly calyx; nearly ½ inch across	Staminate in hairy 2 to 6 inch catkins; pistillate on 1 to 6 inch stalks	In clusters of 2 or 3; showy; anthers numerous and bright yellow
Period	When leaves appear	After leaves appear	Before the leaves	May to July	March or April	Summer
Pollination	Wind	By insects like bees	Wind mostly	Insects or self	Wind mostly	Insects probably
Fruit Nature	1½ inches long, winged, from end buds	Pulpy and excellent for eating	Cone-shaped green cases 1/5 inch long burst freeing seeds	Edible, red, cap-like "berries" with small hard seeds	Brown, shining acorns about an inch long; meat sweet	Hard, dry, angled seed case containing many seeds
Mature	Fall and winter	Fall	Early in the summer	Summer	End of first season	Summer or fall
Dissemination	Blown by wind, wing spins	By animals including man	Blown by wind	By dropping and by animals	Drop to ground	Drop to ground
Seedlings	Seed leaves, 2, narrow, even margined; first leaves shaped like older ones	Seed leaves thick, round, almost stalkless; sharply pointed first leaves			A deep tap-root; cotyledons in acorn	
Enemies	Comparatively free; tussock moth, cottony maple scale, maple borer; leaf spot disease; a few galls	Codling moth, San Jose scale, tent caterpillar; fire blight, apple rust, scab, bitter rot	A poplar borer	Raspberry cane borer is one of worst enemies; a number of caterpillars feed on leaves		
General use to man	Sap makes maple sugar; ashes make potash; wood generally used and tree good for shade	Fruit a valuable food; wood useful; flowers and tree attractive	Paper-pulp producer; quick cover for denuded mountain sides; attractive color in fall	Valuable primarily because of its edible fruit which is eaten fresh or made into jellies, preserves, jams, or as flavoring	Beautiful rapidly growing oak producing edible acorns, fuel, shade and beauty	A most rapidly growing timber and shade tree; produces medicinal oil and is highly ornamental

DINNER'S READY
Louis A. Sanchez, Oakland, Calif.

CECROPIA MOTH
Charles S. Preble, Farmington, Me.

A SNAIL'S PACE
W. J. Breckenridge, Iowa City, Ia.

THE APRIL WINNER

RED-TAILED HAWK
W. T. Wakefield, Bentley, N. D.

FRANKLIN GROUSE
Mrs. W. D. Young, Seattle, Washington

THE TRAIL'S YOURS
© Harold Criger, Jackson Hole, Wyo

A PAIR OF SAGES
Clarence M. Beal, Jamestown, N. Y.

HORNY POSES
M. L. Murray. Sierra Madre, Calif.

OUR PROGRAM

The American Nature Association
The American Tree Association

(The following statement sets forth the aims of these two Associations with respect to Nature Education and Forest and Wild Life Conservation.)

1. Active cooperation and leadership in the great movement to encourage and promote sane and healthful outdoor recreation, especially through the encouragement of an acquaintance with Nature in every family, in every school, normal school, and summer camp.

2. Continuous educational effort to encourage outdoor good manners, to stop the disgraceful littering of roadsides, camp sites, and picnic grounds with refuse, and to prevent the destruction of trees, shrubs, and wild flowers.

3. A constructive policy for forest protection and extension to increase appreciation of forests and all desirable forms of wild life as natural resources essential to the sound economic future of our country.

Specifically:

National Forest Extension A real step towards a forest policy for the United States was taken on June 6, 1924, when Congress passed the Clarke-McNary Forestry Act which provides for federal cooperation with the states in encouraging forest growing and in obtaining increased forest fire protection.

The Clarke-McNary Act again endorsed the principle of national forest extension, particularly in the east, and extended its scope, but did not actually appropriate the money needed therefor. There is a bill known as the McNary-Woodruff bill now before both Houses of Congress. It represents the best thought of practically all organizations interested in forestry. It authorizes and provides funds for acquisition of forest land in the Great Lakes region, in the White and Appalachian Mountain region, and in the remaining pine forests of the south. The total expenditure called for is forty million dollars, which is less than the cost of a single battleship and an even more effective investment for future economic security.

We have in this country over eighty million acres of forest land, lying absolutely denuded and idle. The expenditure of the entire forty million dollars is, in comparison with this gigantic problem, only a drop in the bucket; but it is at least a real forward step.

These areas proposed to be added to our National Forests are useful only for forest growing. The question of grazing cattle and sheep, which has recently caused controversy with regard to some of our western National Forests, is in no way involved in the principle of National Forest extension, but the right of the Federal Government to regulate grazing on land actually suited to necessary forest production must be upheld.

Forestry Research Successful solution of the forestry problem depends in large measure upon adequate and accurate knowledge of many scientific details of the production of growing timber crops. This work is now being carried on through Forest Experiment Stations of the United States Forest Service and through forestry schools and in cooperation with private interests. We urge the extension of this work and the provision of adequate funds for its needs.

National Parks Our National Parks must continue to receive the united support of the people of the United States, and be maintained free from every sort of commercial exploitation. Adjustment of boundaries of our National Parks such as recently approved by the Coordinating Commission on National Parks and Forests must be interpreted along these lines.

The most important question with regard to our National Parks today involves their most effective use. They must be regarded not as potential sites for dance halls and motion picture palaces, but as great outdoor museums of nature. The plan of the Secretary of the Interior in cooperation with the National Park Service, for extension of the principle of Nature Guiding and the development of the parks as places for the real study and enjoyment of Nature in the open, should be upheld by every thinking citizen.

Stream Pollution Modern science renders the pollution of streams unnecessary as well as unhealthful and undesirable. A federal law was recently passed, regulating and decreasing the pollution of our coastal waters. Similar measures, covering inland streams and lakes, should be adopted and in this connection more information regarding the causes and growth of stream pollution must be gathered for the purpose of formulating and recommending the most effective means for reduction of this rapidly growing menace.

Use of Public Lands Inasmuch as all federal public land is the property of all the people and maintained by the Federal Government at the expense of the people as a whole, and for their benefit without discretion in favor of individuals or groups of individuals, it is undesirable and inconsistent to allow any individual or group, corporate or otherwise, to acquire rights of occupancy or rights of use for commercial, recreational, or other purposes when such rights tend to disestablish rights of all the citizens to an equal

enjoyment of the facilities and benefits.

It is necessary to impress upon the public that public property as well as private property must be used in such a manner as to maintain its beauty and usefulness for those who come after. The destruction of wild life, the defacing of natural and historical monuments, the leaving of unextinguished fires, and the careless misuse of camping privileges are not in accordance with these principles.

Migratory Birds The drainage of swamps and lakes for supposed economic purposes has frequently been carried too far without producing the desired results. This has meant the destruction of the normal breeding grounds of many kinds of migratory wild fowl—ducks, geese, gulls, terns, herons, and many of our valuable and useful bird citizens. The only answer to the problem lies in the public acquisition of some of the remaining marsh, swamp, and water areas essential to the existence of migratory wild fowl. Through such acquisition, such areas may be protected from drainage.

A bill to accomplish this object was introduced into the last Congress and failed of passage, due to the rush of other business and the adjournment of Congress. The principle involved has been separately endorsed and passed in previous Congresses, both by the Senate and the House of Representatives. A measure known as the Migratory Bird Refuge and Marsh Land Conservation Act has been introduced in the present Congress and is now pending. It represents the best thought of practically all organizations interested in this problem. Through the Migratory Bird Treaty with Canada, the protection of migratory birds has already been adopted by our Federal Government as a principle, but this additional step is absolutely essential.

HOW THESE OBJECTS ARE BEING ACCOMPLISHED

1. Maintenance of a free educational news service on forestry and wild life to over 2,000 daily papers, in order to arouse public opinion on nature subjects.

2. Conducting a survey of nature study throughout the United States. This survey covers public schools, boys' and girls' organizations, teachers' colleges, and summer camps. It shows in detail where help is most needed.

3. Publication and distribution of books, pamphlets, bulletins, and leaflets on forestry, trees, birds, animals, insects, flowers, and so forth. Many of these publications are distributed free, and others at cost.

4. Maintenance of attractive educational exhibits at outdoor conferences, conventions, and fairs.

5. Preparation and distribution of suitable motion pictures, teaching forestry and nature both for theater use and for use by a staff of experienced traveling lecturers and naturalists.

6. Publication and distribution to all members of the Association of Nature Magazine, a clean, popular, and beautifully illustrated monthly periodical with articles on birds, animals, trees, flowers, plants, stars, and the natural resources of America.

State and Town Forests The Federal Government alone cannot supply the overwhelming need for leadership and example in forest protection. States, towns, school districts, and private individuals can each play their part in protecting and restoring the forests so necessary to our welfare. The ownership of forest land by state or town is more closely the ownership of the people, and, while local conditions best determine whether the state or town plan is more satisfactory, the principle in either case is the same.

The state or town forest stands at the threshold of the American home. It is the property of the people, maintained for the people and operated for their common benefit. It is theirs, within their reach to enjoy and to protect.

It pays its own way, yielding a regularly maturing crop of timber on which, for local consumption, no railroad collects the freight.

It stands as a constant lesson in forest protection and respect for common rights which may be neither wasted nor abused.

Without conflict, healthful recreation and pleasure may here go hand in hand with common dollar profit.

It is a vital aid in the education of school boys and girls, both as a place to study Nature and to play. It naturally becomes a sanctuary and refuge, not only for humans young and old but also for birds and all forms of wild life.

ROADSIDE GOOD MANNERS

The American Nature Association and the American Tree Association will conduct during 1926 an active campaign for the furtherance of Roadside Good Manners. There is no imaginable excuse for the leaving of picnic papers, cans, bottles, and remains of food on the sites chosen for outdoor lunches and suppers. We do not scatter our household refuse on our front lawns, nor do we empty our wastebaskets from the windows of our homes. Public property and property belonging to others must be treated in the same way that we would treat our own. Experienced campers and outdoor lovers repack their refuse and dispose of it at home. If this is not possible, then bury it, or burn it in a suitable place and make sure that the fire is out before going on. Every true woodsman leaves his camp with the idea of being able to revisit the same spot with pleasure.

Numberless organizations are co-operating in the Roadside Good Manners campaign. Among them are the American Automobile Association, the General Federation of Women's Clubs, the Wild Flower Protection Society of America, the Boy and Girl Scouts, and many others.

LEAVE A CLEAN RECORD OF YOUR PLEASURE

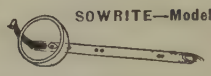
The NEW way to sow seeds!

WITH

SOWRITE $1.00 [Model "A"]

YOU can plant seeds like an expert gardener! *Postpaid*

SOWRITE—Model "A"



Distributes all finer seeds. Made of tough, transparent fiberloid. Metal slide regulates flow perfectly. $1.00 post paid. Use the Coupon!

SOWRITE—Model "B"

For all large seeds up to size of sweet pea. Strongly made of metal, with adjustable slide. $1.50 post paid. Use the Coupon!

ANYONE can get sure results with SOWRITE. Just fill up SOWRITE'S bowl with seeds, adjust the opening to the size of seed, then tap the bowl lightly with your finger.

EVERY SEED SCATTERS AT JUST-RIGHT INTERVALS! Seedlings spring up *separately*. More plants are produced per package of seeds; fewer are lost through "thinning-out." SOWRITE pays for itself in stronger, healthier plants, flowers, and vegetables.—Let SOWRITE do *all* your planting this spring! *Fill out the coupon—Now!*

Clip and mail

"SEERITE"

A Permanent Garden Label That *Can't* Wash Off!

Your garden label is enclosed in "Seerite's" sturdy, clear glass cylinder, and tightly sealed with the cork-tipped wooden peg. In spite of watering can or rainstorms it stays readable always! A box of 8 "Seerites" for $1.00 postpaid. Use the coupon!

8 FOR $1.00 post paid

"BUILT-EASY" BIRD HOUSES

For Beauty and Protection

Attract lovely song birds to your garden season after season. They'll pay their way by destroying thousands of bugs, mosquitos and boring pests!

"A" Three Styles $1.65 each *Postpaid* "C" All 3 "B" $4.50 *Postpaid*

Model "A" and Model "C" for Jenny Wrens. Model "B" for Bluebirds, Martins or Woodpeckers

MAX SCHLING, Inc., 785 Fifth Avenue, New York City.

I enclose (check)—(money order)—(cash) for
"SOWRITE" seed sower—Model "A" ($1.00).....Model "B" ($1.50).....
"SEERITE" marker ($1.00 for 8—$11.00 per 100).....
BIRD HOUSES—Model "A"....Model "B"....Model "C"....($1.65 each—all 3 for $4.50)
Above prices include all mailing costs

Name .....

Street..... City..... State.....
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AMERICAN FOREST WEEK

In the following words, Calvin Coolidge, President of the United States, proclaims the week of April 18 to 24, 1926, as American Forest Week:

In again proclaiming American Forest Week it is fitting that, while giving full weight to the evils resulting from impoverished forests and idle land, I should lay stress upon the outward spread of forestry in industrial practice and land usage. Too long have we as a nation consumed our forest wealth without adequate provision for its wise utilization and renewal. But a gratifying change is taking place in the attitude of our industries, our landowners, and the American people toward our forests.

The wise use of land is one of the main foundations of sound national economy. It is the corner-stone of national thrift. The waste or misuse of natural resources cuts away the groundwork on which national prosperity is built. If we are to flourish, as a people and as individuals, we must neither wastefully hoard nor wastefully exploit, but skillfully employ and renew the resources that nature has entrusted to us. America's forest problem essentially is a problem involving the wise use of land that can and should produce crops of timber.

Flourishing woodlands, however, mean more than timber crops, permanent industries, and an adequate supply of wood. They minister to our need for outdoor recreation; they preserve animal and bird life; they protect and beautify our hillsides and feed our streams; they preserve the inspiring natural environment which has contributed so much to American character.

Although our national progress in forestry has been well begun, much remains to be done through both concerted and individual effort. We must stamp out the forest fires which still annually sweep many wooded areas, destroying timber the nation can ill afford to lose and killing young growth needed to constitute the forests of the future. Forest fires, caused largely by human indifference or carelessness, are the greatest single obstacle to reforestation and effective forest management.

We must encourage and extend methods of timber cutting which perpetuate the forest while harvesting its products. We must plant trees in abundance on idle land where they can profitably be grown. We must examine taxation practices that may form economic barriers to timber culture. We must encourage the extension of forest ownership on the part of municipalities, counties, states, and the Federal Government. And we must take common counsel in public meetings to the end that the forestry problems of each region may be well considered and adequately met.

Word From Zululand

Our mutual friend, Major F. Vaughan Kirby, Game Warden at Nongoma, Zululand, South Africa, sends us another word from the field. Readers will be glad to hear that he survived a close call recently while out on inspection duty. One night between eleven o'clock and midnight an "ill-conditioned black rhinoceros" broke into his encampment and charged straight into his tent. "The whole contraption, of course, collapsed," Major Kirby writes, "and I was left floundering about in the ruins. Fortunately the rhino did not attempt to get at me but passed on into the darkness of the night. My face was badly cut about and a violent kick from one of the brute's front feet has made my shoulder and chest black and blue, and it has been painful, though getting better now."

With respect to his battle to check the wanton destruction of wild life in Zululand, Major Kirby says that he begins "to see a little light breaking through the darkness." He adds that "the Society for the Preservation of the Empire's Fauna is very active, and more than one former champion of destruction has been made to think, and in the process has come to realize that, after all, the champions of preservation are possibly right."

More State Forests

Since July 1, 1925, 2,492 acres have been added to the state forests in Ohio. Additional areas containing approximately 7,350 acres are under option for purchase, at an average cost of $5 per acre, and will be taken over as soon as the titles to the lands are approved.

The Voracious Spider

By Clare G. Sharkey, Jr.

Early one summer morning I chanced to see a spider lying in ambush on a small shelf which he had constructed from a leaf above his web. Many an hour passed as he cautiously waited. Finally a beetle, much larger than himself, flew against his web. Down came the spider and a struggle followed. After battling for more than an hour the spider overpowered his larger victim and carried him back to his hiding place. The next morning I found the beetle half eaten on the spider's web.

A Garden Full of Gladioli

The Gladiolus is one of the most satisfactory flowers grown—it is as easy to grow as the potato. Every family can enjoy this grand flower. They bloom from July to frost if you plant a few bulbs each month from April to July.

Special $2.00 Offer

For **Two Dollars** we will send **50 Bulbs** of our **Grand Prize Mixture,** which covers every conceivable shade in the Gladiolus kingdom.

Special $6.00 Offer

100 Choice Named Varieties (*Catalog Price $9.00*)

For those who plan their Garden according to a color scheme, we offer 10 Bulbs each of the following 10 choice varieties:

Evelyn Kirtland, *Rosy Pink;* **Flora,** *Finest chrome-yellow;* **Le Marechal Foch,** *Fine salmon-pink;* **Mrs. Frances King,** *Vermilion;* **Mrs. Frank Pendleton,** *Deep salmon;* **Orange Glory,** *Rosy orange;* **Panama,** *Rose-pink;* **Peace,** *Splendid white;* **Schwaben,** *Finest canary-yellow;* **War,** *Deep ox-blood red.*

Order Your Bulbs Now, so as to have them to plant when you begin making your garden.

Simple cultural directions in each package

Mention this advertisement and send Check, Money Order, Cash or Stamps, and secure either one, or both, of these splendid collections, sent prepaid to any point in the U. S. east of the Mississippi. **For points West and Canada add 25c for the $2.00 collection or 50c for the $6.00 collection.**

Our 1926 Spring Seed Annual sent on request

Stumpp & Walter Co

30-32 Barclay St. New York City

Established 1866

Naperville Nurseries

Trees, Evergreens, Shrubs, Vines and Perennials

Plant Material for Landscape, Horticultural and Forestry Projects

Catalog Upon Request

Naperville Illinois

Phone: Naperville 1 250 Acres

WATER-LILIES

Can be planted in Spring for beautiful blooms this Summer. Rich colors, refined fragrance, hardy big roots—over 75 varieties—the rarest and fairest from the largest Water-Lily Garden in the country Easy to grow. Send today for Catalog.

THE W. B. SHAW

Aquatic Gardens

Kenilworth, Washington, D. C.

FREE CATALOG NOW READY

Its chapter on the culture of Dahlias is worth any Dahlia lover's time. And it matters little which type or form of Dahlia you prefer, you are reasonably sure of finding it offered in my catalog—at prices more reasonable than those quoted elsewhere, *because* I do grow them by the millions.

J. K. ALEXANDER

The World's Largest Dahlia Grower

100 Central Street

East Bridgewater Mass.

"The Dahlia King"

6 Selected ROSES 50c

A Wealth of Bloom This Year. This collection includes the wonderful **Climbing American Beauty,** fragrant, continuous bloomer; **Golden Ophelia,** golden yellow; **Etoile de France,** large, crimson-velvet; **Columbia,** rose pink; **Mme. Butterfly,** blended pink, carmine and gold; **Peace,** continuous blooming, creamy white. The six plants, all on own roots, selected for vigor and blooming qualities, postage paid for 50c. Send orders to

OHIO ROSE GARDENS, Dept. 215, Springfield, Ohio

ASTER "Lady Coolidge"

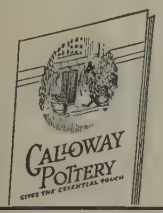
New Introduction. Carmine Rose. Satiny sheen. ong stems, large flowers. A marvel of beauty. Christened. by permission of Mrs. Calvin Coolidge. Pkt. 150 seeds $5.00

John S. Weaver, *Plant Specialist,* **Gordonville, Pa.**

GALLOWAY POTTERY

BIRD BATH No. 371, 32" high, as illustrated, in light stony gray, $22.00, f.o.b. Philadelphia.

Our collection of high-fired, strong and durable Terra Cottas includes shapely jars, flower vases, pots, boxes, gazing globes, sundials, benches, and other interesting garden accessories.



Attractive booklet featuring 64 popular numbers sent upon request.

GALLOWAY TERRA COTTA CO.
3236 WALNUT ST. PHILADELPHIA.

Scott's Creeping Bent for Perfect Lawns!

Sod in six weeks! A rich, velvety stretch of lawn that chokes out weeds before they can grow! A deep, thick, uniform turf that's everlasting and makes your home a beauty spot! That's what you'll get if you plant Scott's Creeping Bent.

The New Super-Lawn

Creeping Bent--long recognized as the ideal grass for golf putting greens--is now producing Super Lawns. Instead of sowing seed, you plant stolons or the chopped grass--and in a few weeks you have a luxuriant lawn like the deep green pile of a Turkish carpet. Read all about this unusual grass in our illustrated booklet "Bent Lawns." Mailed on request.

O. M. SCOTT & SONS CO.
307 Main Street Marysville, Ohio

6 Splendid ROSES

Everblooming. All bloom this summer. Mailed postpaid for **50c**

BARGAIN COLLECTION
Madame Butterfly—yellow
Helen Good—cream pink
Red Letter Day—crimson
Madison—white
Lady Roberts—salmon
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SPECIAL BARGAINS
6 Chrysanthemums, assorted kinds 50c
15 Mixed Gladioli 50c
6 Bedding Coleus 50c
4 Dahlias, assorted kinds 50c
4 Butterfly Bushes (Sum. Lilac) .50c

Any 3 collections for $1.35 The entire 5 collections postpaid for $2.50. Send your order today.

COMPLETE NEW CATALOG FREE
Lists 400 roses, all the newest and best. Dahlias, Ferns, Plants and everything for the house and garden. Send for it.

Great Western Plant Co., Dept. 309 Springfield, Ohio

From Roe to River

Aimed to set forth graphically the methods to be used in "planting" fish in streams, the New York State Conservation Commission has recently completed a motion picture film illustrating this work. Together with this, a pamphlet has been prepared to be sent to sportsmen and citizens generally who wish to aid in conservation by stocking the public waters with fish. It is felt by the commission that there is material loss by unwise stocking and that this can be overcome by education. Citizens of New York interested in this work can obtain detailed information from the Conservation Commission at Albany.

Africa Transported

Mr. and Mrs. Carl Akeley have sailed for Africa at the head of an expedition that is to gather new material for the African Hall to be created at the American Museum of Natural History. The new hall will include forty animal groups made from the specimens collected and with backgrounds painted by Arthur A. Janson and William R. Leigh, who are accompanying Mr. Akeley. The expedition is made possible by Mr. George Eastman of the Eastman Kodak Company and Mr. Daniel E. Pomeroy, manufacturer, both of whom are joining the party. Headquarters will be at Nairobi, Kenya Colony.

Mammalogists to Meet

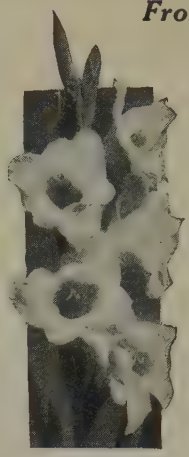
The annual meeting of the American Society of Mammalogists will convene in New York City from April 28 to May 1. The first three days will be devoted to papers and business with an excursion of mammalogical interest on the fourth day. Headquarters will be at the Sherman Square Hotel. The committee on arrangements is H. F. Osborn, chairman; H. E. Anthony, H. Lang, W. K. Gregory and Childs Frick.

A Fishy Power Plant

An interesting photograph from the *Seattle,* Washington, *Daily Times* comes to hand through the interest of a member. It shows Dean John N. Cobb of the College of Fisheries at the University of Washington trying to light an electric bulb with an electric torpedo fish as a power plant. Although this fish is known to possess the faculty of giving an electric shock, it is unable to provide serious competition for our public utility plants.

GLORIOUS GLADIOLI

From July to Frost



Plant April 25 and every three weeks till July 1 and enjoy a long processional of beautiful bloom—

To give you this pleasure and at the same time acquaint you with the remarkable quality of Schling's Bulbs we make this very special offer—

100 BULBS $3.75

Or if you prefer—50 Bulbs for $2.00

Choicest Mixture (Splendid Value at usual price, **$7.00**)

Choicest assortment of the latest and most beautiful varieties, including the lovely Primulinus or Orchid Gladioli, running a gamut of subtle pastel shades from ivory yellow to iridescent coppery bronze such as mark the finest nasturtium collections. This collection will be the pride of your garden and a joy to all who behold it—better double the order if you have room for them—you won't have a bulb too many.

N. B.—Send for our ***Import Bulb List*** and save money on bulbs.

Schling's Bulbs

618 Madison Ave. North, N. Y. City

5 FINEST MONTHLY ROSES $1.95 Postpaid

Strong-Rooted, 2- or 3-year-Old Bushes; Nearly 2 ft. High

To Add Quickly 1000 Customers

We make this remarkable SPECIAL OFFER on the finest, fragrant varieties:
COLUMBIA, newest big pink; GOLDEN OPHELIA, rich yellow; PREMIER, rose pink; DOUBLE WHITE KILLARNEY, ivory white; new deep red.
Every bush has already bloomed. AMERICAN LEGION, fragrant

GUARANTEED
TO GROW AND BLOOM
For You, or Money Back

Pick regular, long-stemmed hot-house roses all summer and until frost comes.

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Saving Primeval Forest

Unremitting activity is being carried on by the Cook Forest Association with headquarters at 331 Fourth Avenue, Pittsburgh, Pa., toward saving what is described as "the last remnant properly exemplifying the primeval pine and hemlock forests of the northeastern United States." This is a glorious tract of some eight thousand acres in western Pennsylvania along the Clarion River. Funds are being raised for the purchase of this tract, largely through small but numerous contributions. Mr. Thomas Ligget is secretary of the association, which includes some of the leading citizens of the vicinity among its officers.

The Common Yarrow

Although similar to the glance, the common yarrow and the tansy are not the same in fact. On page 14 of the January issue of NATURE MAGAZINE, the photograph of the fern-like tansy rosette should have been labelled the common yarrow. We are indebted to the keen eyes and botanical knowledge of several of our members for this correction.

Nature in the Newspaper

Readers of the *News-Herald,* the newspaper of Franklin and Oil City, Pennsylvania, are fortunate in having "Jim" Borland. "Jim" is managing editor of this afternoon daily, but besides this responsibility he is responsible for a daily column athwart the editorial column. More often than not this department is a Nature department, either written by "Jim" himself or supplied by readers or correspondents The editors of the country are awakening rapidly to the almost universal interest of their readers in Nature, and the citizens of Franklin County are fortunate in having such an editor.

No Seedling, This!

In front of the Detroit Public Library are several large trees, and the widening of Woodward Avenue threatened them. Mrs. Florence M. Barber of Royal Oak, Michigan, calls our attention to how these trees have been saved. One by one they have been moved bodily some thirty-five feet away. In the instance of the largest tree, which is eighty years old, it was necessary to leave a chunk of earth seventy-five feet in circumference and five feet thick around the roots. The tree was lifted out of the hole and, on an elaborate system of rollers, moved to its new berth.

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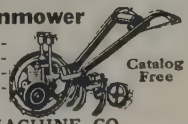

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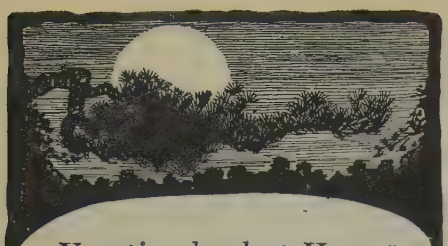

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The special combinations offered in our folder will make it easy to arrange for a beautiful restful lawn—your "vacation-land at home."

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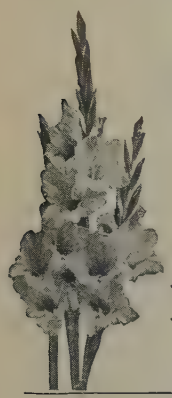

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Brighten the Corner

"A Nature corner for every schoolroom in Kansas" has been for some time the slogan of the Kansas State Teachers College at Hays. Professor L. D. Wooster sets forth the reasons for such an aim with the assertion that "we want a Nature corner because we know:

"1. That if a teacher once gets such a thing started he will never want to be without it thereafter.

"2. That such a Nature 'corner' will furnish the teacher with the very thing which he thinks he does not have, namely, an outline of Nature study.

"3. That, with such a 'corner' developing, the teacher will realize that Nature study is just the most natural thing imaginable; that it need not take time out of the regular school program; and that the pupils will plan and develop much of the work connected with it.

"4. That Nature study is not a matter of assigning lessons about Nature, but that it is lessons which the pupils assign themselves—with the teachers' encouragement.

"5. That the teacher is not for the purpose of pouring information into pupils, but rather is a guide, stimulator, and organizer.

"6. That Nature study not only does not add work to the teacher's load, but that it actually makes the load more interesting and more easily arranged."

A Federal University

There is cause to wonder frequently just how widespread is the knowledge and appreciation of the work that is being done by the various executive branches of our Government. Indeed, it is unfortunate that there is not a wider recognition of the facilities it offers. The Department of the Interior has recently issued an attractive pamphlet under the title, *A Federal University for the People*, setting forth the broad scope of its activities. The contents are well worth the ten cents that may be sent to the Superintendent of Documents, Government Printing Office, Washington, D. C., for the pamphlet.

For Forest Week

A number of pamphlets, leaflets, envelope stuffers and posters are available free from the United States Forest Service for use in spreading the idea of American Forest Week. They may be secured by writing to The Forester, United States Forest Service, Washington, D. C. The list of material with a brief explanation follows:

Served in Famous Old Virginia Inns

Millar's Sugar Cured Ham for over 160 years has been served to guests as a superb delicacy in the famous old Manors and Inns in the Vale-of-the-Shenandoah. And now you, too, can have this rich, sugar cured delicacy on your own table. It's something more than just ham! The flavor and quality is guaranteed on a make-good basis. Hams weigh 8 to 15 lbs. *Dealers wanted.*

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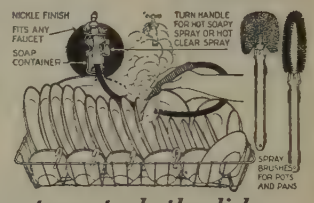
Keeps YOUR hands out of dish water!


NICKLE FINISH
FITS ANY FAUCET
SOAP CONTAINER
TURN HANDLE FOR HOT SOAPY SPRAY OR HOT CLEAR SPRAY
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A pleasant way to do the dishes

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The DARLO may be put on or off in a jiffy. Its patented Soap Container uses any kind of soap. All metal parts nickle-plated. Tested and endorsed by Good Housekeeping. Illustrated FOLDER sent on request. (Please mention dealer.)

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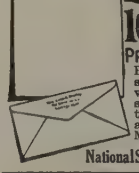

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My New Booklet

will tell you all about these unusual plants, how to care for them, how to grow them in a tub or half-barrel, and how to make a pool. I will be glad to send you a copy on request.

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GROW TREES—A 16-page pamphlet covering the essential facts about timber growing and the observance of American Forest Week. Specially prepared for the Week.

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HOW THE NATIONAL FORESTS ARE HANDLED—Pamphlet dealing with methods and policies followed by Forest Service in management of Government forest land.

PINES FOR PROFIT—New leaflet dealing with growing pine timber in the South.

IDLE LAND AND COSTLY TIMBER—Pamphlet dealing with timber growing and land usage.

TIMBER DEPLETION AND THE ANSWER—Brief economic survey.

Three posters are available:

FIRE: THE OUTLAW—Known as the Wolf poster. Two colors, red and black.

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The following bookmarks and envelope stuffers can be had:

FIRE: THE OUTLAW (Bookmark)—Shows picture of wolf. Two colors, red and black.

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THE NEGLECTED CAMPFIRE—Black and white.

CARELESSNESS WITH CIGARETTE STUMP—Black and white.

New Ohio Nursery

The State Forestry Department at Wooster, Ohio, has arranged for the purchase of a fifty-six-acre forest nursery site near Marietta. This tract will be ample to care for the forest planting needs in the southern Ohio district. The department will abandon in a few years the nursery site at Camp Sherman, under lease from the Federal Government, because of unsuitable soil conditions. The department expects to distribute over a million trees this spring for forest planting purposes, nearly four times the number sent out last year.

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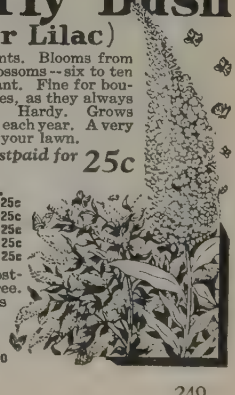

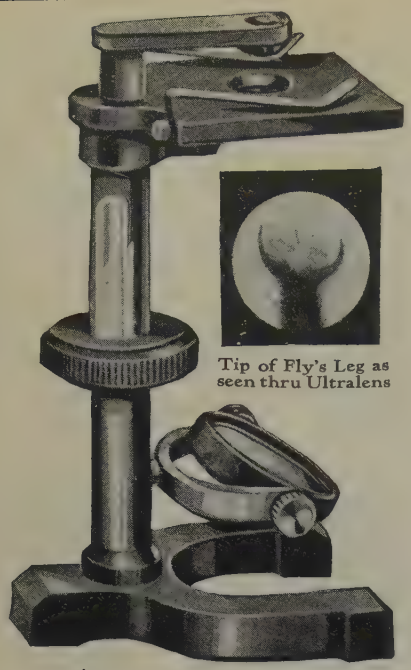

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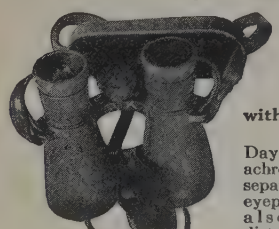

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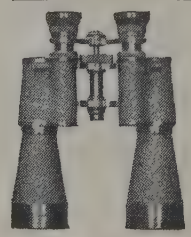

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Texas or Florida

Some two years ago the live-wire Outdoor Nature Club of Houston, Texas, started a campaign for a State Bird for the Lone Star State. The balance of sentiment was in favor of that famed troubadour of Dixie, the mockingbird. Now the St. Petersburg, Florida, Audubon Society, is espousing the cause of the same bird for similar honors in the boom state. The *Houston Zephyr,* publication of the former society, opines that "in all sincerity, we feel sure that Texas has more mockingbirds than Florida, and that our Texas mockers are the sweetest singers of all the Southland's wonderful chorus of graceful, gray-coated minstrels." The evidence in the case is not in from St. Petersburg, but it would seem that two such wide-awake organizations of bird lovers would have little trouble in ironing this out and at the same time adding immeasurably to the movement for State Birds in every state.

Tune in on WCAP

Monday evenings NATURE MAGAZINE and the American Nature Association will be on the air from Station WCAP, the Chesapeake and Potomac Telephone Company of Washington, D. C. Clap on the earphones and tune the squeaks out and listen to fifteen minutes of popular Nature talks by Editor Ridsdale and other officers of the Association and members of the staff.

Deer Photograph

The photograph of deer by Charles M. Ross, published in the Amateur Nature Photographers Contest page in the February issue of NATURE MAGAZINE is copyrighted by Mr. Ross owing to its unusual character.

Fire Laws That Bite

It is becoming a serious matter to break the forest fire laws of Oregon and Washington. One hundred and eighty-five people found this out last summer when they left fire in the woods, were brought to justice by officers of the United States forest service, and were found guilty. It cost them $2,777 in fines and $518.95 in court costs. These figures are given in a report just issued by the district forester's office, Portland, Oregon. A total of one hundred and eighty-four cases were prosecuted and only three found not guilty. In addition to these criminal cases, settlements were secured in seventeen civil cases, in which damages were collected by the Government to the amount of $8,238.60.

Mention NATURE MAGAZINE *in answering advertisements*

A Winter Frog Story

Many people have raised their eyebrows in doubt at this story, but Charles W. Manktelow of Cadillac, Michigan, asserts that it is true—every word of it. It was a cold day one eighteenth of December, he writes, and while walking around Lake Cadillac he came upon a sluggish, muddy stream that serves as a channel between two lakes. A crust had formed on the snow, which lay about eight inches deep. Mr. Manktelow noticed that "the crust and snow had formed a sort of wall into the water. I noticed a great number of small holes in this wall of crusted snow. Something moved in some of the holes, and I stopped and looked. I could scarcely believe my eyes when a frog jumped from a hole, then another and another. I investigated and saw that the crust was hollow underneath and that it was full of green frogs. They came up under the crust from the water's edge and then jumped back and forth into the water. I should like to know whether anyone has ever seen such a thing before."

Testing Seed Aviators

Foresters from the Pacific Northwest Forest Experiment Station have just carried on a novel experiment in scattering Douglas fir seed from a kite to see how far it would be carried by an average wind. The test was conducted on Pearson Field, the Vancouver, Washington, aviation grounds. A measured amount of seeds, each equipped with the tiny wings provided by Nature to help its widespread dissemination, was released from a big box kite at about one hundred and seventy-five feet above the ground. A number of large white canvas squares spread out at intervals to leeward up to sixteen hundred feet from the kite, told the story of where the seed fell. Three separate tests were carried on during which the wind was blowing about eight miles an hour.

The most seed fell on the canvases eight hundred and fifty and eleven hundred feet from the kite. On the latter canvas three hundred and two seeds were picked up, which is at the rate of eighty thousand seeds to the acre.

"This experiment gives the forester a clue to the actual distances that seed trees may be expected to scatter their seed," says L. A. Isaac, who conducted the test, "and the information should help in devising means by which logged-off land may be reforested by natural seeding."

Ostrich Photographs

The fine photographs of ostriches in the center of the March issue were the combined work of William L. Finley and H. T. Bohlman.

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And because you do not spin or "crank" the flywheel over compression the flywheel "flip" that starts the Elto is merely a movement of wrist and forearm! Not a matter of strength—no manual labor—actually a finger-tip job! *Any young girl can do it!*

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Milwaukee

The Super Elto

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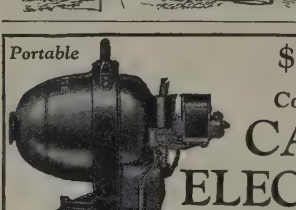

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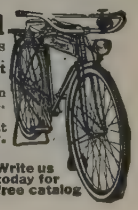

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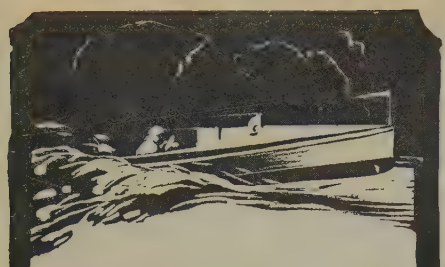

Brilliant!

THAT one word describes the sparkling performance of the new 1926 Universal Flexifour—the little 2⅝" x 4" Four-cylinder Marine Motor that develops 15 full horsepower.

And behind that brilliance are 26 years, during which Universal's reputation for utter reliability has spread into 37 countries—26 years devoted to the refinement and perfection of the small 4-cylinder, 4-cycle marine motor!

Flexifour is the kind of motor that puts joy into your water play-days, because it's trouble-free and smooth, and easy to start, and easy to operate. Below is shown just one example of how Universal has banished the grief from motor boating. Write for the full story, and for your copy of "Standing the Gaff," the epic of Flexifour's famous 500-Hour Non-Stop Run. Mention size and type of your boat.

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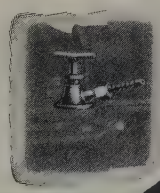
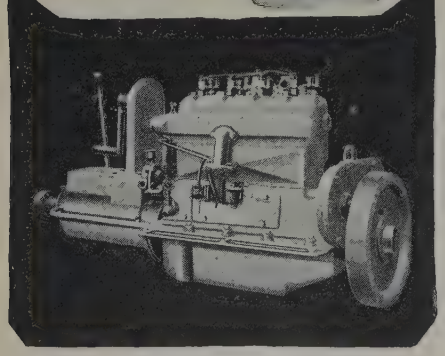
Universal Flexifour MARINE 10-15 H.P. MOTOR

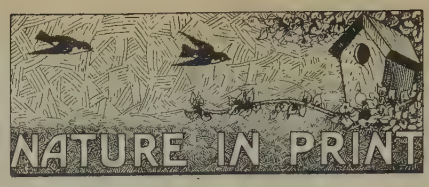
Old Oil—Out Quick!

Hand Sump Pump

A simple, positive, plunger pump. Just poke the end of the hose into a bucket and pump the crankcase dry in a few strokes!







Now We Know

With a rapidity that can be likened to the speedy sputter of the machine gun, these last few years have surrounded us with a thousand and one products of inventive genius, refinements of comfort, perfections of progress, adjuncts of efficiency. They have come, been accepted and entered into our lives, often without much publicity or comment. Yet behind most of them there is romance and a story of interest. Recognizing this, the Engineering Foundation of 29 West 39th Street, New York City, has collected in Volume Two of its *Popular Research Narratives,* "fifty brief stories of research, invention, or discovery, directly from the men who did it, pithily told in language for laymen, young and old." The book is from the press of Williams and Wilkins Company, Baltimore, Maryland, and sells for one dollar.

From a Bishop-Poet

"The cedar bird, song sparrow, the blue jay and the wren
Call out the season's greeting, 'Glad to see you once again.'"

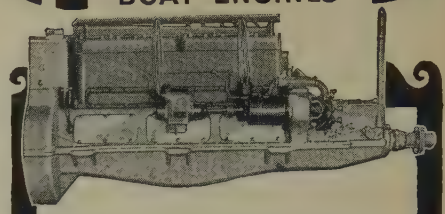
Particularly appropriate to this moment of the year are these two lines from "Spring Friends," one of the charming verses from the second of two delightful little volumes of *Verses by the Way* from the pen of James Henry Darlington, Bishop of Harrisburg, and from the press of Brentano in New York. One dollar and one half is the price of each book. Both of these volumes are refreshing in their variety and in the simplicity of their verse. Nature, the trees, the birds and others among our wild friends naturally find their way markedly into these verses. Bishop Darlington has an active interest in Nature and the outdoors, and it was he who urged the churches in his diocese this last Christmas time to check the decorating with greens that are fast disappearing in the face of widespread and indiscriminate gathering.

The Meadows

Nature pulses in every line of *The Meadows,* a collection of twelve essays on the outdoors, which its author, Professor John C. Van Dyke subtitles, "Familiar Studies of the Commonplace." The book is fresh from the press of Charles Scribner's Sons, 597 Fifth Avenue, New York City, and is listed at two dollars.

"The Valley of the Raritan," Prof. Van Dyke writes, "hardly needs an apologist and it has never had a eulogist . . . I have set myself the task of writing about the familiar life and growths of this landscape and somewhat of the lasting loveliness of

KERMATH
BOAT ENGINES



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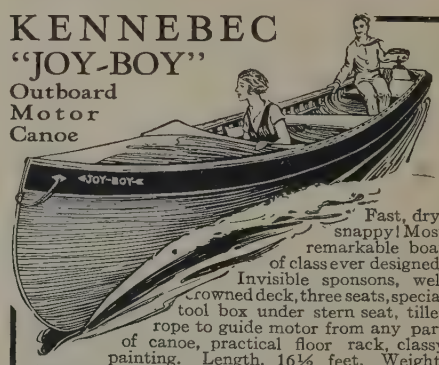
"JOY-BOY"
Outboard Motor Canoe



Fast, dry, snappy! Most remarkable boat of class ever designed. Invisible sponsons, well crowned deck, three seats, special tool box under stern seat, tiller rope to guide motor from any part of canoe, practical floor rack, classy painting. Length, 16½ feet. Weight, about 125 lbs. Price only $118, f.o.b. Waterville, Maine. A sensational success! FREE CATALOG shows this and 16 other models.

KENNEBEC CANOE CATALOG 20 pages

Kennebec Boat & Canoe Co.
Dept. T-11, Waterville, Maine

the landscape itself. To be sure the birds and animals and flowers were not created to be written about, nor for our comfort or admiration. They live for their own joy of life. But if we can find pleasure in their right living and fair showing, have we not ourselves attained to nobler being?"

From "Things Familiar," the first essay, to "Blue and Purple," the last, in which the author glorifies November, this volume is charming Nature at its charmingest so far as it can be transmuted into words. We recommend it to the vacationist who vacations in the open.

More Summer Camps

Through the department of education of *The Red Book Magazine* Mr. Henry Wellington Wack has been annually adding to camp literature from the practical point of view. Each year the volume from Mr. Wack's typewriter has been larger and more complete, and now comes *More about Summer Camps*. It is an interesting, readable, suggestive and serviceable book for the camp director. In it the author discusses various kinds of camps instituted as adjuncts to a variety of organizations, he touches upon what can be learned in camp and what should be learned, makes a survey of various camps he has visited, emphasizes in particular the possibilities and importance of Nature in camp activities and makes a strong plea for active forest conservation work in camps.

Florida Flowers

The entertaining article in the March issue of NATURE MAGAZINE on the Flowers of Florida by Mary Francis Baker appears to have excited no inconsiderable interest. The book by the same author on the same subject will be published by Macmillan and Company later this year. This is expected to be a needed volume as well as an attractive one in point of illustration, the photograph of the tar flower used in the magazine story, incidentally, being one of those which illustrates the book itself.

Valuable Leaflets

We are delighted to learn that many members found a helpful suggestion in the notice published in the February issue about the botanical leaflets of the Field Museum of Natural History in Chicago. Director Davies reports that there were orders for these leaflets from all parts of the United States. Another leaflet can now be added to the botanical series, being Leaflet No. 11 on Common Trees, sold for twenty-five cents.

The Field Museum also has available eight attractive zoological leaflets. The first six are available at ten cents each and their titles are: The White-tailed Deer, Chicago Winter Birds, The American Alligator, The Periodical Cicada, The Alligator Gar and the Wild Turkey, The Man-eating Lions of Tsavo (a forty-page leaflet with illustra-

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Write at once for full particulars, prices, etc. The MCNAB RUDDER is sold through Sporting Goods Dealers everywhere. If your nearest dealer can't supply you, we will ship direct. (Dealers: write for free literature.)

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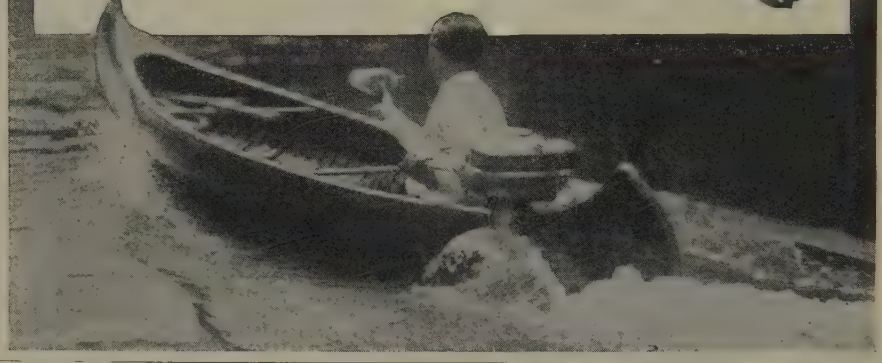

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Highest quality water and mildew proof, convertible tent.

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Most available head room ever built into a tent. **Entirely new.**

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tions, costs fifty cents), and Mammals of the Chicago Area sells for twenty-five cents.

In another group there are seven leaflets along geological lines and entitled: Model of an Arizona Gold Mine, Models of Blast Furnaces for Smelting Iron, Amber—Its Physical Properties and Geological Occurrence, Meteorites, Soils, The Moon and Early Geological History of Chicago. The first six are available at ten cents each and the seventh at twenty-five cents.

The Lone Swallows

In his preface to *The Lone Swallows*, Henry Williamson asserts that "association with birds and flowers in childhood—when the brain is plastic and the mind is eager—tends to widen human sympathy in an adult life." It is apparent that Mr. Williamson enjoyed such an association because in this volume of essays of the country green—in its American edition just from the press of E. P. Dutton and Company, 681 Fifth Avenue, New York City—he passes it along to the reader. Just to quote the opening words of the essay on The Incoming of Summer is to give a hint of the charm of these writings.

"Where by the stream the towers of the wild hyacinth bore their clustered bells, sought by that God-vestured hunchback the wild bee, the willow wren sang his little melody, pausing awhile to watch the running water. The early purple orchids grew with the bluebells, their spurs upraised, their green leaves mottled with purple."

The Garden Irises

The garden lover who grows irises is in debt to Uncle Sam through B. Y. Morrison, horticulturist of the Office of Horticultural Investigations of the United States Bureau of Plant Industry, for a valuable pamphlet just come from the public printer. It carries the title *Garden Irises* and is a valuable and helpful manual for the gardener. The pamphlet sets forth the distribution of the iris, discusses varieties, emphasizes its garden and landscape uses, outlines processes of propagation and closes with a statement of how to combat the enemies of this flower. The pamphlet is available from the Superintendent of Documents, Government Printing Office, Washington, D. C., at ten cents a copy.

For the Entomologist

Advanced students of the insect world will find a valuable contribution to entomological literature in a recent eighty-page bulletin of the Smithsonian Institution entitled *The Morphology of Insect Sense Organs and the Sensory Nervous System.*

A BALSAM PILLOW
makes a most delightful gift. We crowd the fragrance of the forest into a beautiful green or rose silk, hand-embroidered cover.

1 lb. 8 inches square size is $1.00.
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NEW—Super-Power Twin Motor—At normal speed develops 3.85 H. P. [Brake Test]. In racing trim develops 4.65 H. P.
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NEW—Five Days' Trial Offer —Gives you a chance to match with any other Motor

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LOCKWOOD-ASH MOTOR COMPANY
615 Jackson St. Jackson, Mich.

Easy Control Easy Starting

2¾ H.P. Light Weight

The only outboard motor that gives you easy starting because of Dual Ignition and easy control forward or backward by mechanically adjusting pitch of propeller blades. Has twin cylinders, light weight, lots of power, lots of speed. Sold on our "Pay as you Play" plan—only $37.00 down; balance in monthly payments. Catalog tells all. Send for it.

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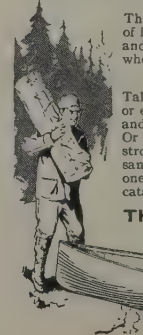
CAILLE DETROIT 5 Speed Twin

Take Your Boat Along!



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Take it with you on your fishing or vacation trip, or even on an outing of a day or two. Fold it up and put it in your auto or in the baggage car. Or tuck it under your arm and carry it. Light, strong, and safe. No other boat like it. Thousands in use. Don't go another season without one. Get all the facts. Write today for free catalog.

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Readers' Service Department

We have frequent requests from members and readers for sources of various materials and things of Nature. It is in view of this that this column is made available

A Shell Collector

The Rev. Joseph Ambauen, Route 2, Vining, Minnesota, is desirous of adding to his shell collection, either through purchase, contribution or exchange. He particularly wishes: Pen shell, ark shell, cockle shell, cat's paw, lion's paw, tiger's eye, scallop, jungle musex, nutmeg, turkey's egg, turkey's wing, coconut shell, jingles, donax or wedge shells, paper fig shell, angel's wing, crown melongena, tulip shell, Scotch bonnet, olive shell and Chinese alphabet shell.

Wanted, One Marmoset

Among others interested by the Marmoset article in the February issue of NATURE MAGAZINE, Mrs. T. E. Moore, 24 Franklin Street, Milford, Massachusetts, would like to get this little animal for a pet. Can anyone help Mrs. Moore out if the Marmoset supply is not already exhausted as a result of the magazine article? Henry H. Lewis, Box 73, Echo, Oregon, also wishes a marmoset.

Meal Worms and Newts

Meal Worms and Spotted Water Newts are the need of Mr. L. H. Hahn of 107 Emmet Street, Joilet, Illinois. He wishes the former in large quantities.

Who Has Bull Frogs?

Arling Steinberger, Box 157, McFarland, California, would like to get in touch with someone who raises Bull Frogs (*Rana catesbiana*) or *Rana grylio* for breeding purposes or for market. He is interested to know, also, whether such frogs would find the climate in the San Joaquin Valley of California to their liking.

More Shells Wanted

Miss M. L. Hays of Happy Jack, Louisiana, is interested in adding to her shell collection either by exchange or by purchase of additional specimens.

Geologists, Attention!

Mr. John A. Manning of 2900 Connecticut Avenue, Washington, D. C., wishes to add a crystal of Iceland spar and a cluster of quartz crystals to his otherwise complete geological collection. Can anyone help?

RUSTIC HICKORY HARMONY

There are lots o' things in Nature that just seem to always be in tune with each other—violets on a wooded hill; poplars on a river bank; birds against a summer sky.

And then there's Rustic Hickory Furniture in a summer home, where the woods and waters meet in everlastin' friendliness. For Rustic Hickory Furniture is Nature's own product, made from selected second growth hickory with the bark left on, and the rough edges taken off.

Real comfort and lifetime durability have been built into this unique furniture, and there's a piece for every nook and corner of the home, porch or lawn. For over a quarter of a century Rustic Hickory Furniture has faithfully served Nature lovers from every section of our country, and the first pieces built are still in use.

See our exhibit at the National Outdoor Life Exposition, Coliseum, Chicago, May 10-16, 1926.

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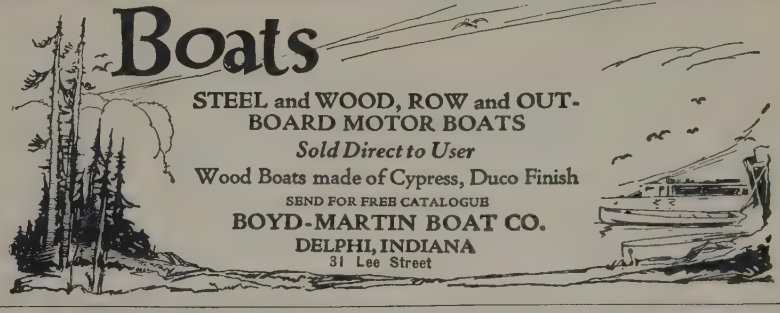

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A Nature Puzzle

In this puzzle a word of twelve letters is concealed, one letter hidden in each line, and the whole word suggested in the last couplet. For example, to take the first line, the letter "c" is in "cottonwood" but not in "pine." Now see if you can finish the enigma!

My first is in cottonwood, not in pine,
My second in forest, but not in vine,
My third is in aspen, but never can be
In ash—that's my fourth, which is not in tree,
My fifth is in linden, but not in plum,
My sixth in larch, but never sweet-gum,
My seventh in arbor-vitae is seen,
My eighth is in leafy, but not in green,
My ninth is in chestnut but not in beech,
My tenth is in ivy of lofty reach,
In oak my eleventh, but not in spruce,
And my twelfth in walnut but not in juice.
My whole is an aim for which we should strive,
To keep our beautiful forests alive.

The answer to this puzzle will be printed in the May issue.

School Nature Club

With the rapid spread of Nature study in the schools, the formation of school Nature Clubs is proving a valuable extra-curricular movement. At the Muncy High School in Muncy, Pennsylvania, there is a new organization known as the Charles Lose Nature Club and named after Professor Lose. The club plans a little mimeographed publication helpful to its members and has outlined an effective program.

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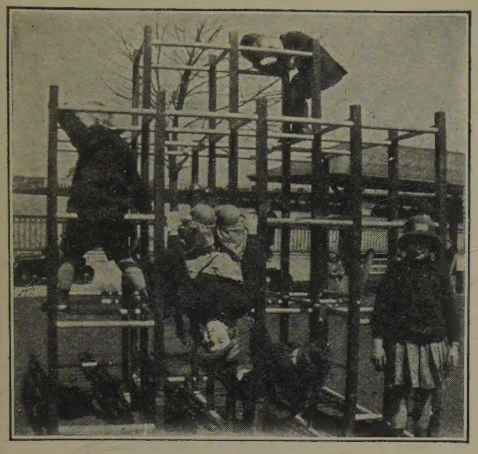

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Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature.

QUESTION: *We have two small white rabbits and I have never seen them take a drink. Do they?*—K. H.

ANSWER: If you supply your rabbits with a great deal of moist food, it may be that they get along without water. Rabbit experts, however, recommend furnishing them with fresh water every morning. In a wild state most rabbits drink every day if possible.

QUESTION: *Do the Hawk Moth and White-lined Sphinx have anything to do with the cross-pollination of the four o'clock flower and the petunia?*—M. C.

ANSWER: We have been unable to find any definite statement that these flowers are so fertilized. However, since many species in this group of plants are known to be self-sterile and to be dependent on insects for their fertilization, it is extremely possible that these moths perform that office for the plants in question.

QUESTION: *Is it true that snakes freeze in winter and thaw out in spring?*

ANSWER: Snakes get pretty cold and stiff in the winter and limber up in the spring, though they do not freeze. (Please give your name in asking questions.)

QUESTION: *Arthur Brisbane in his column states that bear cubs when born weigh only a few ounces and are born when the mother is asleep. Is this true?*—J. H. M.

ANSWER: Cub bears when born weigh only from nine to twelve ounces. In most cases they are born at the season when the mother is hibernating in the winter den, but she is not necessarily asleep. They remain together in the den for several weeks or two or three months until large enough to follow the mother about.

QUESTION: *Can you tell me whether any animals have two sets of teeth like we do?*—M. C. R.

ANSWER: Practically all mammals have what are called milk teeth, as we do, which are lost and replaced by the permanent teeth as the animal approaches maturity.

QUESTION: *Is it true that carved stones sometimes fall to the earth from the sky?*—J. H. M.

ANSWER: Meteorites, or shooting stars, fall from the sky, but we may confidently say that no stones carved by the hand of man ever reached the earth from that direction.

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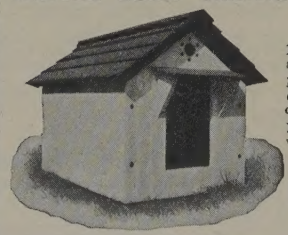

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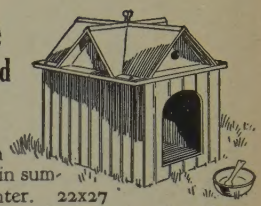

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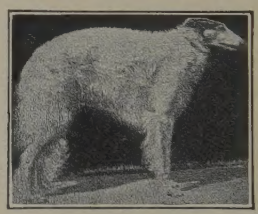

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SCHOOLS OF U. S. READY FOR AMERICAN FOREST WEEK

Educators Indorse Nation Wide Campaign to Reach Public Opinion of Tomorrow on Economic Question

TEN MILLION school pupils of America will mark the semi-centennial of forestry during American Forest Week April 18–24. This celebration will take the form of debates, forestry essay competitions and various school programs during the week. The date will be one of the high spots in the greatest attempt ever made to reach the public opinion of tomorrow with the forestry economic situation of today.

* * *

The United States Government made the first step in forestry in 1876. To mark this semi-centennial year, the American Tree Association at Washington, D. C., has published the "Forestry Primer," and has distributed thousands to teachers, civic organizations, and women's clubs. Every school is called on to mark the date. Planting of semi-centennial trees and their registration on the Association's Honor Roll at Washington is one of the campaigns urged by the Association.

* * *

Requests for the Forestry Primer are being sent to the American Tree Association from every state. Hundreds of organizations, reports to the Association show, are making plans for forestry programs and for planting semi-centennial trees. Teachers are giving pupils lessons in letter writing by instructing them how to send for the Forestry Primer. This idea has been adopted with the greatest success by schools in Atlanta, Cleveland, Denver, Cedar Rapids, Milwaukee, Minneapolis, Maxon, N. C., Central City, Ky., Pioneer, Ohio, Beaumont, Tex., Burbank, Calif., Erie, Pa., Powell, Wyo., Mellon, Wis., and Dover, N. H.

* * *

A remarkable endorsement has been given the Forestry Primer and the object at which it aims. Some of this comment follows:

I am very much gratified to know that the American Tree Association has gone ahead with the publication of the Forestry Primer. We have long needed something of this sort which presents fundamental facts in a simple way. The extent to which a publication of this kind can be used can hardly be overestimated.—*G. B. MacDonald, Professor of Forestry, Iowa State College.*

* * *

Those who have read the Forestry Primer speak very highly of it. One person commented on it thus: "I like the short sentences. Even a child can understand them." You see how it justifies its name of "Primer."—*Harvey F. Heinly, Berks County, Pa., Conservation Association.*

* * *

The Forestry Primer, in our opinion, is an appropriate and timely elementary treatise of the forest situation in this country and one that will be particularly valuable in the hands of the teachers.—*Marcus Schaaf, State Forester, Lansing, Mich.*

* * *

I find in the book a wealth of excellent material of educational value to any speaker who undertakes the presentation of such a subject.—*Charles G. Dunwoody, California Development Association.*

* * *

We, of DeWitt Clinton High School, feel that the Forestry Primer issued by the American Tree Association to commemorate the fiftieth anniversary of the beginnings of forestry in this country is a valuable piece of literature to place in the hands of students. Boys and girls of this generation, of the city as well as of the country, need to be aroused as to the importance of our forests to all.—*Francis H. J. Paul, Principal, DeWitt Clinton High School, New York City.*

* * *

I think the Forestry Primer is one of the best publications I have ever seen in that it is written in such a way that the general public cannot fail to absorb the ideas presented.—*Henry Knowles, U. S. Department of Agriculture, Gloversville, N. Y.*

* * *

I have just read your excellent Forestry Primer. It is splendid. It is the biggest little book I have seen lately.—*G. W. Crozier, Dist. Supt., City Schools, Inglewood, Calif.*

* * *

We cannot help but feel that getting the children interested in tree planting that their efforts will reach directly upon the welfare of the entire region.—*Chester A. Lee, Fort Collins, Colo.*

* * *

I have examined the Forestry Primer published by the American Tree Association and deem it of such value as to warrant its use in the classroom.—*Adam Little, Assistant Principal of Schools, Tippecanoe, Ind.*

* * *

I have looked the Forestry Primer over and find it an excellent addition to the working kit of any teacher.—*R. B. Heinemann, Dover Schools, Minn.*

* * *

Having reviewed your booklet, Forestry Primer, at a faculty meeting, we have found it very worth while.—*Harriet R. Mosser, Barton Hill School, Calif.*

* * *

The message of the Forestry Primer should be brought home to every American citizen.—*T. J. Ossau, Fourth Street School, Milwaukee, Wis.*

* * *

The Tree-planting Army is ready for American Forest Week. Thousands of new members are being enrolled in the tree-planting army, says Charles Lathrop Pack, president of the American Tree Association, who has published the Forestry Primer to make 1926 the semi-centennial of the first step in forestry by the United States Government. For a stamp for postage the Association will send anyone this primer and free planting suggestions. Thousands of semi-centennial trees are being planted and the planters enrolling their names in the Association's honor roll. Be sure and get this information and do the job as it should be done.

* * *

The Associated Advertising Clubs of the World, as well as State and County School Superintendents, Scout and Camp Fire Club leaders, according to President Pack, are giving tremendous impetus to the endeavor to get the forestry message before the coming citizens of America. Every unit of the Associated Advertising Clubs of the World has a Forest Week program scheduled, based on the Forestry Primer.

* * *

Three hundred speakers will put the semi-centennial message before the people of California at the direction of the California Development Association. The Los Angeles, San Bernathino and Pasadena schools, as well as all schools throughout the state, are putting on a big program. In Colorado the semi-centennial of forestry hooks up with the state's semi-centennial. The Denver Chamber of Commerce and the Colorado Forestry Association have big plans under way to be followed by state-wide tree planting. The Parent-Teachers Associations have received a message from headquarters from Mrs. A. H. Reeve, to join in the semi-centennial celebration.

* * *

In many state Forestry Departments are cooperating in the educational campaign. J. S. Holmes in North Carolina, R. S. Maddox in Tennessee, R. P. McLaughlin in Montana, Hugo Winkenwerder in Washington, O. E. Siecke of Texas, and Marcus Schaaf in Michigan being among those to push state distribution.

Forest Week Messages to Young Americans

"There can be no more important educational work than turning the attention of the new generations to the importance of trees. On every hand we will see this importance if we will but look. The thing is to get us to look."—MRS. JOHN D. SHERMAN, *President, General Federation of Women's Clubs.*

"Our civilization is so dependent upon forest products that we cannot do without them. Teachers must do their part in establishing firmly in the mind of the school children the accepted policies of modern forestry."—PROF. E. LAURENCE PALMER, *of Cornell University, Director, Nature Education Section of* NATURE MAGAZINE.

"There is no more important lesson for the American people to learn than the need of growing and conserving forests and trees. Our future development as a nation will largely hinge upon the success with which we can spread this gospel."—JOHN J. TIGERT, *U. S. Commissioner of Education.*

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DODSON Bird Houses Win the Birds

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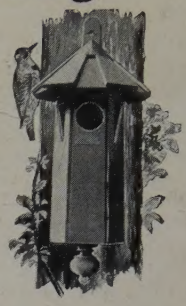
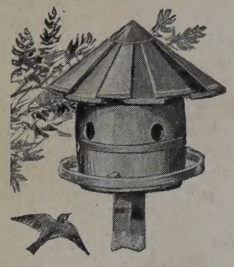
Flicker House



is an enticing lure for these very useful birds. Trees in cities are so well taken care of that Flickers have difficulty in finding homes. They, therefore, take very readily to Dodson's Scientifically Built Houses. Flickers are one of the most useful birds, destroying moths, tree pests and principally ants on trees and ground. Many letters have been received stating that ants have mysteriously vanished since these birds have found homes. House 26 in. high by 12 in. wide by 11 in. deep. Price, $7.00.

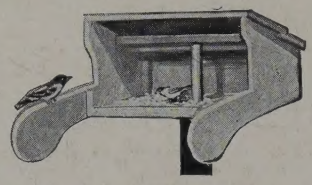
Dodson's Scientific Wren House

as shown above wins the Silver Throated Wren, one of our sweetest singers. A four-compartment house satisfies their habit of changing nests for each of their three broods. Beautiful design, made of oak, finished in green with cypress shingles, copper coping; comes complete with rust-proof snap on hanger. Size 28 in. high by 18 in. in diameter. Price, $7.00.



Bluebird House

The happiest and most beloved Songsters. Dodson's Scientific Houses satisfy these most exacting birds. Made of oak, finished in white and green. Sizes 21 in. high by 16 in. in diameter, with 16 ft. easy-raising pole. Price, $14.00. For hanging only, $7.00.



Automatic Feeding Shelter

Stocked with a few simple foods they crave and Dodson's Suet Cake and Grain Mixture, lures Songsters from the whole neighborhood. Automatically revolves to protect birds from storms. Cypress finished in white and green. Sizes 24 x 22 x 12 in. including 8-ft. pole, $8.50. With copper roof, $11.00.

Dodson's Suet Cake, 40c a pound; Grain Mixtures, 10c a pound. Manchurian sunflower seeds, 25c a pound.

CARDINAL BIRD

Will haunt your Automatic Feeding Shelter

Why Dodson Houses Win the Birds

Mr. Dodson has for many years devoted his entire time to lecturing, visiting beautiful estates in the study of wild birds all over America. Many seemingly insignificant details have been discovered and patented by him that are vital in the luring of Songbirds to man-made houses. Mr. Dodson is always willing to talk before clubs or associations interested in creating bird sanctuaries, either private or municipal.

Bird Bath

This handsome stoneware bath is not only an ornament to any garden but is the only one where knowledge of the birds' habits, fears and preferences have been considered in designing a bath that the birds enjoy and use. Complete with 32 in. stand. Price, $26.00. Write for our big catalog of art stoneware furniture.

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Making friends with a Black Capped Chickadee at his Kankakee Bird Sanctuary

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"Your Bird Friends and How to Win Them." My fascinating book sent to anyone who loves our beautiful Songbirds. It is full of things you should know. Based on 40 years' study of this interesting subject.

Protect the Songbirds from marauders. Dodson's Guaranteed Sparrow Trap rids your premises of these pests.

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Wonderfully brilliant authentic pictures in natural colors on the order of the Cardinal Bird shown herewith. Leave the selection of birds found in your locality to us. The children love to find the birds to match the pictures. Size, 7 x 9 inches.

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